

THE IRON AGE

New York, February 6, 1930

ESTABLISHED 1855

VOL. 125, No. 6

To Build 100 Car Bodies an Hour

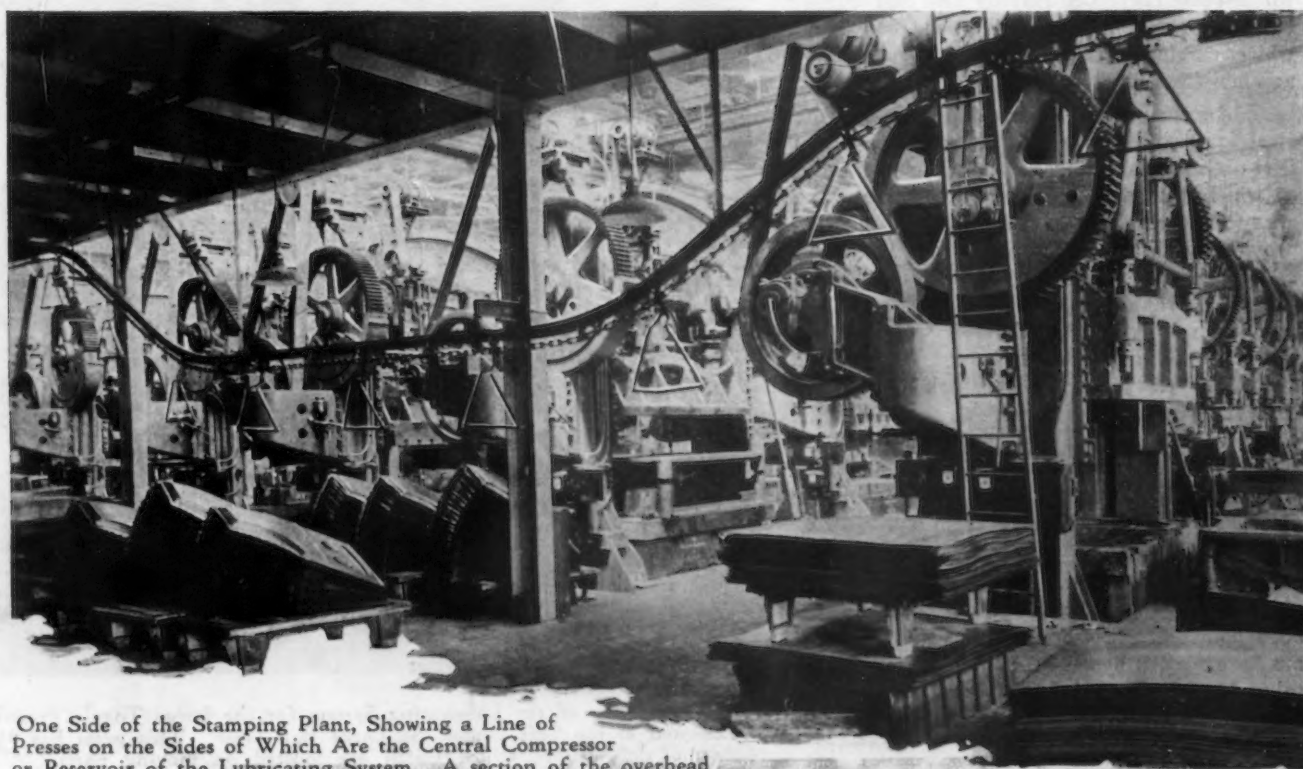
Murray Plant Laid Out for Scheduled Rate of
Output—Lacquer and Paint Handling
Are on the Roof

AN automobile body-building plant recently erected by the Murray Corporation, Detroit, is laid out for a fixed production schedule of 100 bodies an hour or 900 in a 9-hr. day. With departments for manufacturing the stampings, assembly and painting, as well as for receiving the stock and shipping the finished product, this plant is a complete unit within itself.

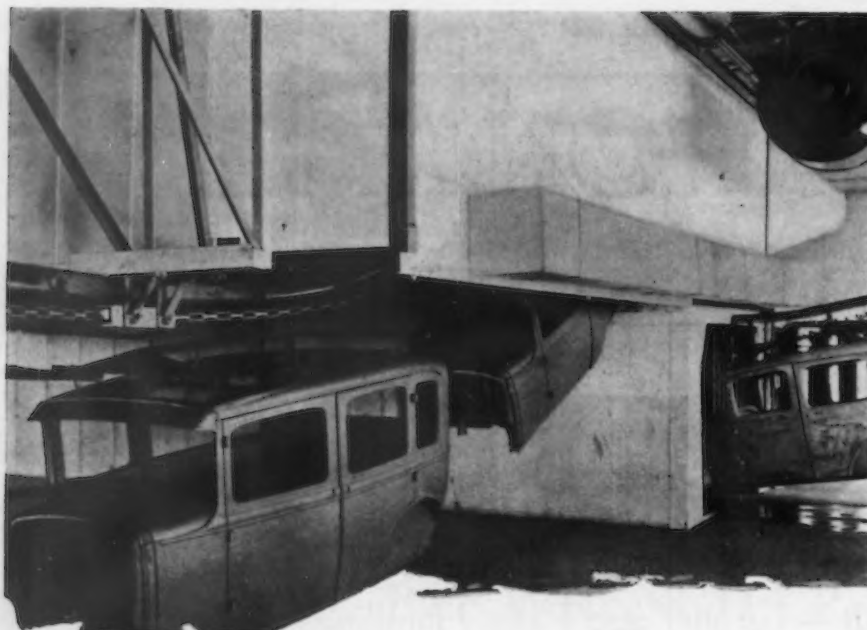
To keep work flowing through all departments at the proper speed equipment was provided to maintain the scheduled rate of output in the various operations. The time element was used also as a basis of arrangement in the painting department, the location and spacing of spray booths, ovens, air-dry sections, rubbing docks, etc., being carefully planned to allow the proper length of time for each operation and drying period, with a uniform conveyor speed.

A body going through the various coating operations takes 9 hr. 19 min. from the time it reaches the cleaning department until it is ready for installation of the trim. Quality is not sacrificed for speed, because the standard set by the company calls for high-quality work. The painting department is divided into two sections occupying separate floors. On one cleaning is done and the under coating is applied. This takes 5 hr. 58 min. On the other the lacquering is done, as well as other work incidental to finish painting. It takes bodies 3 hr. 21 min. to go through this department. Bodies move through the painting department for the various operations of cleaning, priming, surfacing and lacquering at a uniform speed of 8.8 ft. a min.

This new body manufacturing unit includes a stamping plant 200 x 425 ft. and an adjoining L-shaped seven-story assembly building 525 and 350 ft. long, 100 ft. wide. Alto-



One Side of the Stamping Plant, Showing a Line of Presses on the Sides of Which Are the Central Compressor or Reservoir of the Lubricating System. A section of the overhead conveyor for carrying finished stampings from the press room is in the foreground



Space Is Saved in the Painting Department by Having Double-deck Drying Ovens

gether there is 540,000 sq. ft. of floor space. The plant is fully equipped with conveyors of various types for handling parts, assemblies and bodies in the various manufacturing processes.

The one-story stamping plant is equivalent in height to a three-story building and its sawtooth roof provides exceptionally good lighting. The press shop is arranged for large output and for convenience in handling and routing work. The presses, 175 in number, are arranged in 17 rows with from 9 to 11 machines in a row, with one or more rows of machines for making a single part. They are arranged for progressive assembly so that the piece, if it is a panel, on leaving the last press at the end of the row is a completed unit with all moldings, window reveals, window flanges, etc., stamped in place and ready for assembling. On leaving the last press the panel is hung on an overhead conveyor which carries it to the proper floor of the assembly building.

The press bays are served by five 15-ton electric traveling cranes for handling dies. Dies not in use are stored on mezzanine floors, of which there are five located at intervals above the press shop. One of the cranes is provided with a movable cab, which is found to be a great convenience in handling dies. After the crane is spotted over the press the operator moves his cab along its runway on the crane to a point that brings it directly over the press, where he can look down and control his operations in setting or removing a die, without depending on signals. With the convenient facilities for handling and storing dies it is stated that all dies in a line of presses can be changed in from one to two hours.

A centralized system of lubrication is provided for all the presses. Between 5200 and 5500 points are lubricated while the presses are in operation by 240 systems, each of which takes less than 2 min. to operate. A valve on each bearing delivers to the bearing a predetermined measured quantity of lubricant under high pressure and shuts off automati-

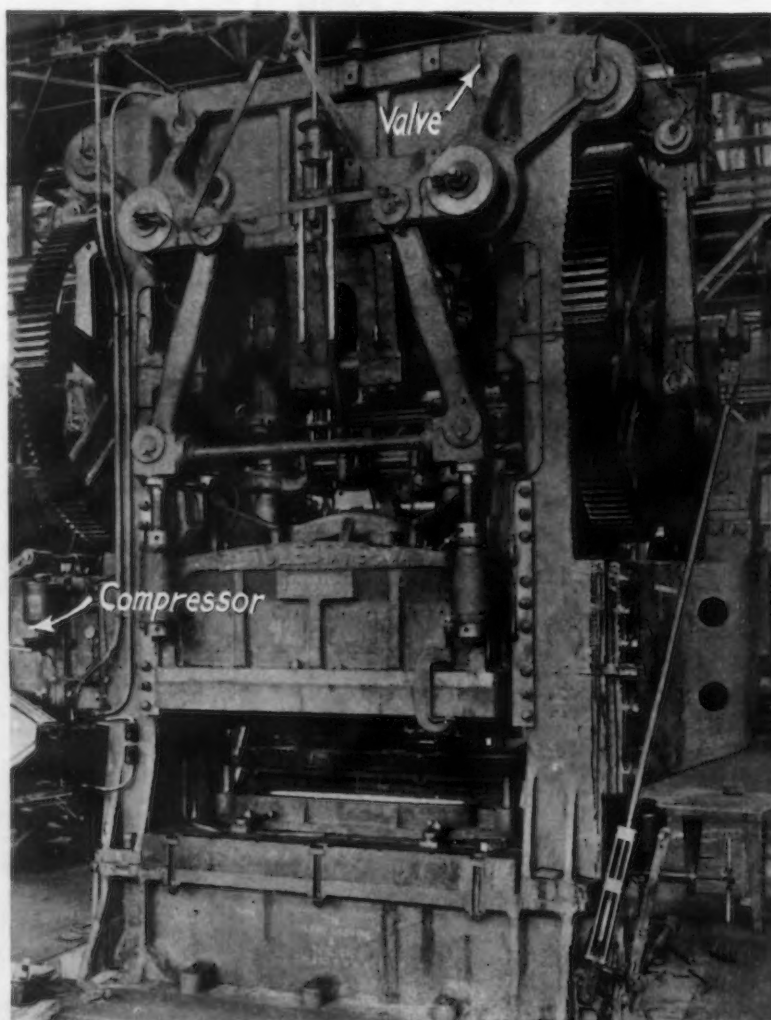
cally. In addition to the mechanical lubrication of the bearings, the air cushions on 109 presses, grouped into 23 systems, are lubricated mechanically with an average of six to eight points of lubrication on each press.

It is stated that to lubricate all these bearings by hand would require eight oilers to each shift, but with the mechanical system one man per shift suffices, making a saving of 14 oilers a day when the presses are operating at two shifts. The lubricating equipment, which is said to be the largest installation of centralized lubrication in the world, was installed by Lubrication Devices, Inc., Battle Creek, Mich.

How the Plant Is Arranged

Extending the full length of the plant at the side of the press shop is a steel storage and a loading and unloading bay. This is served by two 15-ton traveling cranes. Cranes deliver the steel from the cars to the storage floor and from the storage floor to the front of the rows of presses. Two presses for blanking are located at the side of the storage floor.

Two railroad tracks extend through this bay. Sheet



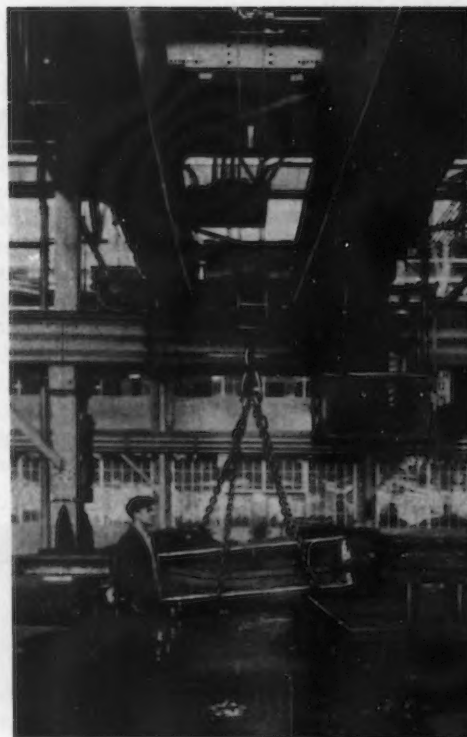
The Compressor of the Lubricating System for the Large Toggle Presses Is Located at the Left Under the Large Bull Gear. This press has 91 points of lubrication, 40 of which are located on moving parts. All lubricating points are reached by flexible hose and copper tubing



**SUB-ASSEMB-
BLIES** Are
Welded with Gun-
Type Spot Welders
with Flexible Hose
Connections to Over-
head Welding Ma-
chines

* * *

MEZZANINE
Floor for Die
Storage, Above the
Press Shop, Has a
Movable-Cab Crane
for Handling Dies



steel is received in flat cars and scrap is carried out on the inner track. Finished bodies are loaded in box cars on the outer track. A conveyor brings the bodies to the loading dock from the fourth floor of the assembly building. A machine shop for press and die repair work is located on a mezzanine floor at the side of the steel storage building.

Scrap metal from the press operations is carried on 30-in. belt conveyors, one at the side of the first row of presses and another extending the length of the press room in front of the presses. These conveyors discharge the scrap to other conveyors in the basement, which deliver it to a baling press. The bales of scrap are elevated to a level above the loading bay by a conveyor which dumps them into flat cars.

Parts are carried from the press room on two lines of conveyors, one for parts that are to be trimmed and the second for completed stampings. Panels are stored and doors assembled on the first floor of the assembly building. The door frames, panels and reinforcements are brought to the assembly jigs and flanging presses by overhead conveyors. After assembling, the doors are placed on a platform type of conveyor for metal finishing and then on an overhead conveyor which transports them to the body paneling line on the third floor.

Nearly all the trimming operations are done with trimming presses, but, on parts of low production, trimming is done with metal band saws, as this method is found more economical. Saws for trimming are arranged in two parallel lines; back of each line is a belt conveyor which carries the scrap to the baling press in the basement.

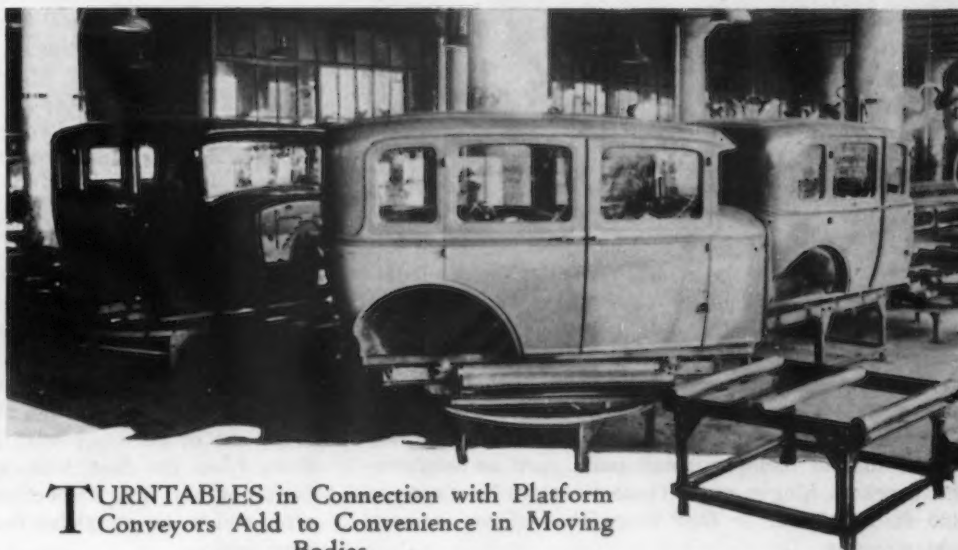
Spot Welders of Gun Type Are Used

Welding and finishing are done on the second

floor, as well as the trimming that is done with band saws. Practically all the welding on the body sub-assemblies is done with special spot-welders of the gun type developed by the company. The welding guns are attached to flexible cables connecting to the welding machines, which are suspended overhead and may be moved along the assembly lines for convenience in operation.

The seats, side panels and back panels are butt welded into a single piece on large butt-welding machines. The piece leaves the machine as a continuous panel or the formed body from door to door and from sill to roof. The cowl panel is welded in the same manner. The units are then placed on platform type conveyors for the metal-finishing operations, after which overhead conveyors carry them through openings in the floor to the body paneling line on the floor above.

A special revolving punch is used in the assembly department in place of a standard type punch for making and countersinking very small nail holes. This is an unfluted tool the ends of which, instead of being flat, as in a punch, have a 5-deg. angle. This tool on being spun into the piece cuts out a slug the same as a punch. The objec-



TURNTABLES in Connection with Platform
Conveyors Add to Convenience in Moving
Bodies

tion to the use of punches of the very small diameter required for this class of work is that they break frequently. The use of this tool obviates that difficulty.

Framing and Assembling on Third Floor

The body framing and the final body assembling are done on the third floor. The wood parts composing the under body, roof and frame are received from the company's mills fully machined and ready for assembly. These units, together with the all-steel front end assembly, are assembled in body-framing jigs which hold dimensions to close limits. The wood body frames are carried by conveyors through spray booths, where they receive a sealer treatment to prevent dry rot, variation of the moisture content and the ravages of insects, and then to the six body paneling lines of the moving platform type occupying the rear end of this floor. When the body reaches the end

On reaching the sixth floor the body is hooked on to an overhead conveyor, which elevates it to the ceiling after various operations and down to the working level for succeeding operations, as well as for carrying it through the ovens for drying. Some of the drying ovens have two chambers, one above the other, and some save floor space by being elevated several feet above the floor. The bodies are thoroughly cleaned by the Deoxidine process and receive two coats of metal primer, the putty glaze and two coats of surfacer.

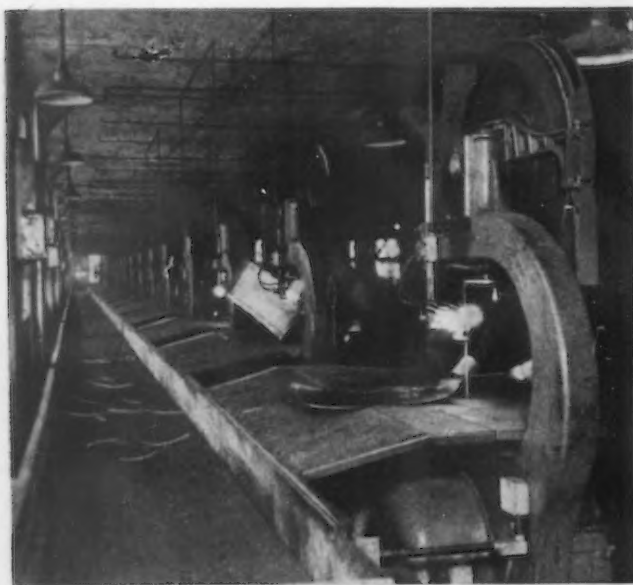
After the final sanding operation the body goes to the seventh floor for the color coats and the installation of the roof deck material.

Safety Served by Location of Paint Work

By having the painting departments on the sixth and seventh floors, volatile and inflammable liquids are kept

CONVEYOR lines for Paneling (at Right)

ABELT Carries Away the Scrap from the Metal Band Saws for Trimming Stampings. It is found more economical to trim here those parts which are not made in large quantities (Below)



of one of these lines it is completely paneled with doors fitted and hung, and is ready for painting and trimming.

The painting department is located on the sixth and seventh floors. The body after assembling is carried to the sixth floor on a vertical conveyor operating in an elevator shaft. Several carriers of this type connecting different floors are used, some for conveying bodies up and others down, including one for taking the bodies from the fourth or final assembly floor to the loading dock. The regular freight elevators are used only for transporting workmen and for handling small parts such as reinforcements, brackets, hinges, etc. These elevators have a speed of 400 ft. a minute, or four times that of an ordinary freight elevator.

where they do not endanger other parts of the plant. At the same time, this arrangement permits the use of the roof for handling the lacquers and paints.

Located on the roof are 24 mixing vats equipped with agitators which keep the lacquers and paints at a constant consistency and the colors uniform. Rotary pumps beneath the mixing tanks keep the lacquer in continuous circulation in pipe lines which serve the spray booths on the two top floors. The spray gun lines are connected to these pipe lines, thus eliminating the fire hazard caused by open containers of lacquer. Air contaminated by fumes is exhausted from the spray booths to the roof and is replaced by fresh, heated air delivered through a heating system on the roof.

Cushion and seat backs and trim panels are manufactured on the fifth floor. The sewing machines are placed in rows facing each other, with a wide belt-type conveyor running between them. Light overhead conveyors handle the trim panels from operation to operation. The cushions and seat backs are trimmed on moving lines, the cushion line having an upper rail equipped with rollers for compressing the spring while it is being trimmed.

The fourth floor is used for the installation of glass, cushions, trim hardware, etc. Here are conveyors of the platform type with ingenious turntables at the corners, to permit the bodies to be shunted about as necessary. Overhead copper feed wires supply current to the trimmer's portable lights. The plug ends of light cord are attached to contacts on a wooden trolley block, which slides along with the conveyor. When the trimmer has finished, and steps out of the body with his light, he lifts the trolley block from the feed wire by an attached wood handle. Stripping and final inspection follow the trim installation, after which the completed body is transferred to the shipping dock.

Alloys That Resist Heat

Selection of Suitable Material Not a Simple Problem—

Four Classes of Alloys Available—Corrosion
and Heat Resistance Same Problem

BY T. HOLLAND NELSON*

SINCE the original discovery of the so-called stainless and rustless steels and the various developments which have led to the variety of such alloys now available, much has been written on the value of certain chemical combinations and their resistance to various corrosive conditions. In other words, while we have, during the last few years, made rapid strides in the investigation and application of materials to combat rust and corrosive action, perhaps not quite so much attention has been given to this particular type so far as its application to the field of high temperatures is concerned.

Not Two Problems But One

PROBABLY this is due to the fact that manufacturers and users alike have chosen to regard the field of corrosion resistance and heat resistance as two entirely separate subjects and this is fairly well borne out in actual manufacturing operations. It is not unusual at all to find that the heat resistant alloys are produced by a few foundries specializing in this particular product, whereas the corrosion resistant alloys are more or less the product of the tool and alloy steel manufacturer, because most of

them are malleable and are required in various fabricated forms.

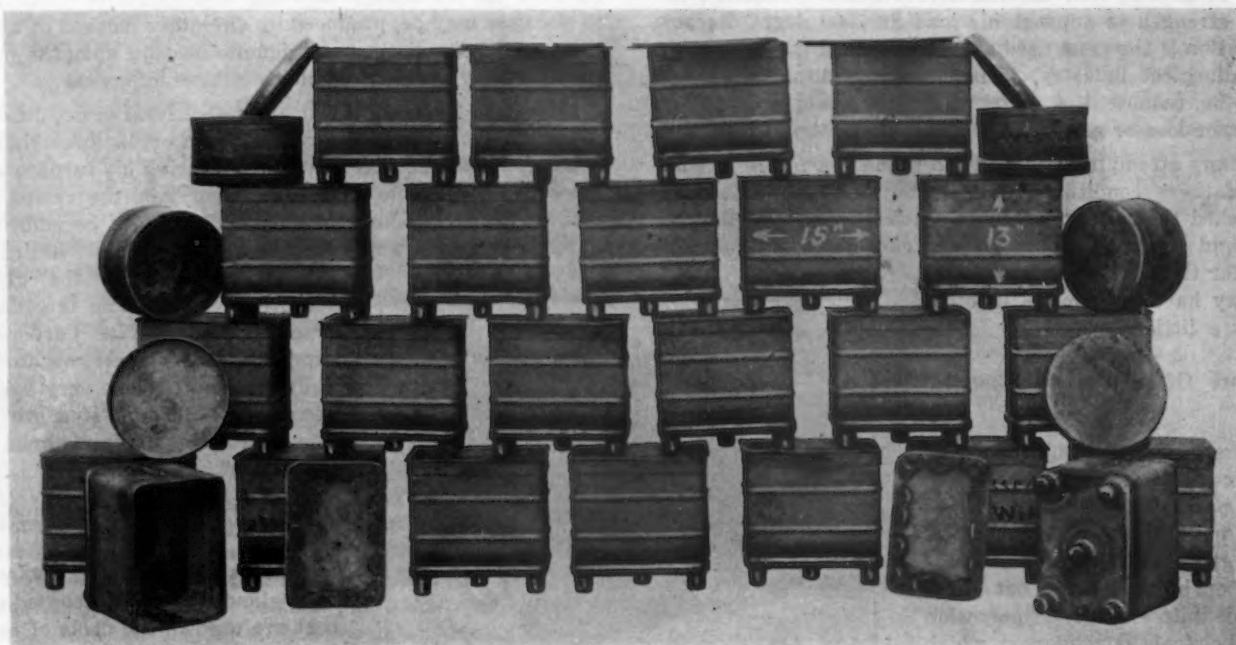
A glance at the analyses of a few of the alloys advocated for use at high temperatures, for the purpose of maintaining strength at temperature and resistance to attack by oxidation, will immediately show their striking similarity to many of the alloys used in the field of corrosion resistance. The author of this article, after being engaged almost exclusively on the study of heat and corrosion resistance problems for several years, has come to the conclusion that, instead of regarding these two subjects as entirely separate fields, it is much safer to regard them almost as one and the same subject; classified, if you like, as corrosion at normal temperatures by either gases or liquid solutions, or corrosion at elevated temperatures where definite physical strengths are required.

Heat Corrosion in Domestic Heaters

A heat resistant problem that is quite familiar to everyone, whether he be a layman or a scientist, is the domestic electric heater and the resistance wire used for this purpose. This material has formed the basis of many of our so-called heat resistant alloys.

It is not my intention to burden the reader with details concerning the development of the type of electric

*Consulting metallurgist, Widener Building, Philadelphia. This is the fourth article in a series on stainless steels and irons and corrosion and heat resistant alloys. The three previous articles were published in THE IRON AGE, April 25, 1929, page 1139; May 30, page 1478, and Oct. 3, page 887.



Pressed and Welded Carburizing Pots Made from an Alloy Containing Approximately 25 Per Cent Nickel and 17 to 19 Per Cent Chromium. This type is giving excellent service (courtesy of Pressed Steel Co., Wilkes-Barre, Pa.).

resistance wire in use today, but as its use has been well within the knowledge of most of us, it is not difficult to trace back in memory some of the early resistance wires which were probably satisfactory from the viewpoint of electrical resistance, but subject to embrittlement in continued service. I mention these two facts because they are probably the fundamental principles governing the subject of this particular paper.

Two Terms the Basis of Specifications

The development of the present high nickel-chromium alloys, possessing as they do excellent physical properties at high temperatures and all the electrical properties demanded, together with substantial immunity to oxidation under atmospheric conditions, are the result of years of labor and study by engineer and metallurgist alike. I think, however, in approaching the general subject of heat resistance, insufficient stress has been given to the fact that such heat resistant elements invariably operate under normal atmospheric conditions, and the natural reaction from such a state of affairs has led to the use of two terms when discussing the subject of heat resistance. These, even up to the present time, seem to constitute the alpha and omega of specifications laid down for the selection of suitable alloys for service in a variety of fields.

The terms alluded to are:

Physical properties of the alloy at definite temperatures, and

Rate of oxidation at any particular temperature.

During the last few years the seriousness of attempting to obtain a satisfactory alloy by demanding a certain strength at a definite temperature or freedom from oxidation at a certain temperature has been brought home very sharply by investigation of failures that have occurred from time to time, even when the designing engineers concerned have made every possible allowance for contingencies by using high factors of safety, etc.

Let me cite a concrete instance. One particular case that was responsible, perhaps, for my starting out on a more intensive study of the subject was the use of a retort at an estimated temperature of 1900 deg. Fahr. continuously. In designing the original installation it is reasonable to assume that the engineer concerned required certain strength to support his load at 1900 deg. Because oxidation is the most used and abused term throughout the metallurgical industry, it is equally natural to suppose that he requested a material which would not oxidize, scale, or lose or gain weight at that same temperature.

Many attempts were made to produce a retort to withstand these conditions, but at the time the writer approached the subject I think I am fair in stating that six or eight weeks would have been considered a reasonable life for this retort; in some cases it may have been more, in other cases a little less.

Failure Often Due to Chemical Corrosion

A study of this subject pretty soon convinced the author that, in this particular industry, failure was not arising from lack of strength at an elevated temperature or by oxidation, but there was definite evidence of corrosion by chemicals and gases, which were attacking either some particular element or all of the elements and their various chemical compounds in the alloy.

I cite this instance because, as

stated before, it was probably the first that stimulated my interest in corrosion by various gases at high temperatures. There was the possibility of producing alloys of definite chemical combinations to resist such corrosion.

Once started upon a line of thought, it is not at all difficult to gather together further information to support this substantially. How many of us as metallurgists so frequently hear one of our colleagues extolling the virtues of one particular alloy only to find that someone else, apparently in exactly the same type of process, readily condemns the same material. Yet we would not suggest that an alloy would behave differently because of a different geographical location.

Take the case hardening industry as an example. I have in mind two of the largest installations in the country, under excellent metallurgical supervision, with one alloy in use at one plant and an entirely different alloy in use at the second plant. Each chief metallurgist assured me that the alloy in use in the other installation is of absolutely no use to him.

Carburizing Conditions Hard to Meet

In an article such as this it is seldom possible to give more than a thought, or a train of thoughts, which may lead those interested into a deeper study of the subject. Much information of a private nature reaches a consulting metallurgist which, of course, he cannot divulge.

But while on the subject of case hardening, let us just for a moment realize the innumerable types of carburizing compounds on the market; their various chemical compositions; the variety of energizers used in some of them. Then let us turn around and glance for a moment at the various furnace designs and types. We are confronted with gas-fired furnaces, oil-fired furnaces, electric heating furnaces, cyanide pots, etc.

When we realize how easy it is to say carburizing or case hardening and imagine just the transfer of carbon to the outside case of low-carbon material, what a small phase of the actual problem we are really visualizing and how reasonable it might be to assume that, with all these variations, such as the by-products from the carburizing compound, the by-products from either the oil fuel or gas fuel, or the oxidizing, reducing and corrosive condition, as the case may be, produced by any other method of heating, may have a distinct and definite bearing upon the most suitable alloy to use in combating these influences.

If I have conveyed my thought clearly, it is not difficult to realize that in this there may be an explanation that if one user had oil fuel as a means of heating his furnace and the other two employed electricity or gas, the varied attack of the by-products of combustion might be sufficient to explain clearly why one finds a different alloy desirable or advantageous in the given conditions. The same is equally true of various case hardening compounds. Moreover, we do not fully realize also how very vague become the terms "strength at temperature" and "resistance to oxidation."

Alloys for Both Corrosion and Heat

Let us digress for a moment and glance again at the alloys that are used in the fields of both corrosion and heat resistance. To those of us who have the opportunity of daily observing these various alloys from the liquid to the solid condition, it is fairly easy to prescribe alloy compo-



Cast Carburizing Pot of the High Nickel-Chrome Type

sitions that resist oxidation at definite temperatures. For instance, some of the simple stainless steels resist the formation of scale at temperatures up to 1450 deg. Fahr. By the further addition of chromium, nickel or silicon, the temperature at which this scale formation takes place is raised, and it is possible to produce alloys that do not oxidize in the sense of forming disintegrating scale up to temperatures of 2000 deg. Fahr., or somewhat in excess of this. But is the information at present being handed out by the trade really what is wanted? Further, can it not be very misleading?

The author realizes that he is dealing with a very delicate subject. As a practical steel manufacturer and as a student of metallurgy, I am advancing these thoughts, not as an arm chair critic, because I have a very high regard for a great deal of the work that has been done by some of our leading metallurgists in determining definite strengths at temperatures, creep tests, and much valuable information for long-time changes governing the physical properties of many of the alloys to which I refer.

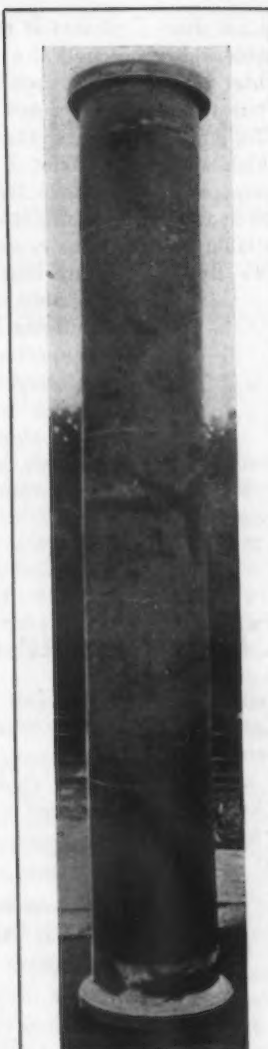
However, a consultant is to some extent like the medical practitioner who is called in either at a birth to prescribe a diet in the hope of producing a good and wholesome result, or at the other end of the story to diagnose the disease and if possible either advise or aid in curing it. With this thought in mind I am apt to view the published literature on the subject of heat resistant alloys, such as issued by the various manufacturers, with some temerity.

If the reader will take the trouble to call for catalogs, even those of our leading manufacturers, he will find that "strength at temperature" and "resistance to oxidation" are the factors around which the various manufacturers invariably advocate the use of their A, B, C or D material as the case may be.

The thought I am endeavoring to convey becomes staggering in the possibility as to how seriously an incorrect application of this information can be. Further, in many of our complicated chemical industries, it becomes necessary to establish entirely different information, because oxidation may not be by any means the most serious factor, but corrosive attack by various gases may be sufficient to attack the alloy as a whole or attack various elements within it, producing spongy and obviously weak material with, of course, ultimate failure.

Special Dependence on Certain Alloys

It is fairly obvious that in the production of materials with high physical properties at elevated temperatures the steel manufacturer in the light of today's knowledge is substantially dependent upon the alloys of chromium, chrome-silicon, nickel-chrome-silicon in conjunction with iron, or without iron, to obtain his results. There are, of course, other additions made in smaller proportions from time to time, such as cobalt, aluminum, tungsten, or molybdenum, added with the object of obtaining varying physical properties or increased resistance to attack, but in the general sense of the word the heat resistant alloys available are substantially the chromium, chrome-silicon or nickel-chrome-silicon type alloy in which the proportions of nickel and chromium and silicon are calculated to give



Retort Designed to Meet Chemical Corrosion Conditions at High Temperatures

definite physical properties with freedom from oxidation at a definite temperature.

Four Classes of Alloys

GENERALLY speaking, these have been placed in about four classes:

- 1.—An alloy of approximately 60 per cent nickel or upward with 20 per cent chromium or higher with iron 20 per cent down to traces only.
- 2.—An alloy varying according to different manufacturers, with from 25 to 40 per cent nickel and from 10 to 20 per cent chromium, the remainder iron.
- 3.—Various modifications of alloys containing from 15 to 25 per cent chromium with from 8 to 15 per cent nickel.
- 4.—Alloys containing from 7 to 14 per cent chromium, with silicon from 0.5 to 5.0 per cent.

The usual run of sales data published would advocate the use of No. 1 for temperatures as high as 2000 to 2200 deg. Fahr.; No. 2 for temperatures from 1800 to 2000 deg.; and No. 3 from 1600 to 1800 deg.; and the physical properties are plotted and offered to the trade as to their varying strength at definite temperatures.

Special Steel for Valves

While the above analyses are typical of the heat resistant alloys offered in the cast form by the trade, there are one or two striking deviations from these which the writer feels thoroughly support his contention. Take, for instance, a typical chrome-silicon valve steel of the following approximate analysis:

	Per Cent
Carbon	0.45 to 0.55
Silicon	3.00 to 3.50
Chromium	7.50 to 9.00
Nickel	Traces to 0.25

This material is in service at temperatures which may range as high as 1500 deg. Fahr. or even higher at times. Moreover, in the form of automobile valves, this alloy is in contact with the by-products of motor fuel, etc. This type for the last few years has been practically uniformly adopted by

the entire trade where internal combustion engines are used. The manufacturer requires the material to possess certain physical properties, however, to enable him to produce it in the various forms required and these properties enable him to make the following claims:

- 1.—To produce an alloy which is malleable and capable of being produced in bar form by ordinary mill practice.
- 2.—And I am quoting one of the manufacturer's own phrases—"that does not scale at temperatures up to 1500 deg. Fahr."
- 3.—Metal which is capable of being forged and upset into valves.

Experience also shows this type of alloy to possess remarkable resistance to the corrosive attack of the by-products of gasoline in internal combustion engines.

More Nickel Than Chromium Not Essential

Another striking instance which would seem to upset very seriously the idea which seems to have been more or less standard that heat resistant alloys must contain, invariably, more nickel than chromium, has been brought about by the demand of the user and the fabricator. Take as an instance the recent rapid development that has occurred in the built-up or pressed steel carburizing box.

This has led to considerable saving in weight over the

cast metal, and of course the resulting economies are due to the fact that in the container itself there is considerable less metal to heat. In other words, by using a lighter carburizing pot, not only has heat been conserved but time elements have also been capable of reduction. To make this possible it was essential to have a metal which was obtainable in sheet, bar, rivet and welding rod form; and the high nickel-chromium alloys, referred to earlier in this article, invariably used as castings, were not available in suitable form for this new development. But we have materials of the following approximate analysis:

	Per Cent
Carbon	0.20 to 0.40
Silicon	0.50 to 3.5
Chromium	15.0 to 25.0
Nickel	20.0 to 25.0

Within this range of analysis alloys are obtainable in the various forms required, which are day by day demonstrating their ability to withstand the many and complex

phases of the carburizing industry at temperatures of 1800 deg. Fahr. maximum. It will be noted that in this type the proportions of nickel and chromium are very close together and in many cases the chrome-silicon content is greater than the nickel.

What I wish to point out is that in this particular instance the deviation from previously established alloys was found necessary to *produce the material in the form it was required*. Further, that we are from time to time finding that those modifications which, viewed in the light of established precedent, might be regarded as producing an inferior article, are in many cases producing equal if not superior results, all because, in my opinion, some of these alloys are more truly approaching corrosion-resistant materials with distinct resistance to oxidation or corrosion at elevated temperatures, conditions which we have previously so casually referred to under the broad heading of *oxidation*.

(To be concluded)

Cast Steel Anchor Chain Made in 90-Ft. Lengths

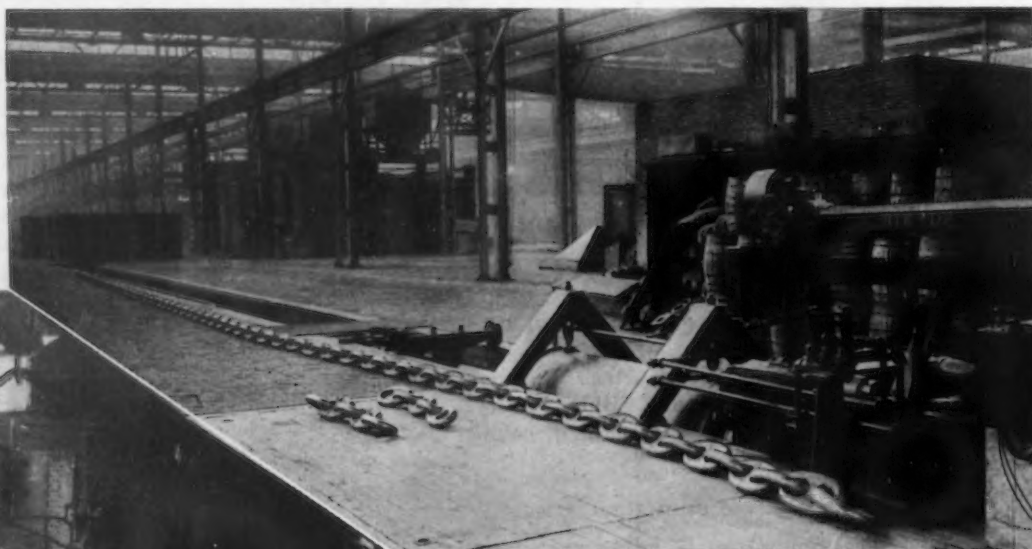


DURING the war considerable interest was aroused in a new development for making large steel anchor chains in molds. Articles describing the new method of making cast steel chain, in which a special type of steel was incorporated, were published — particularly those in *THE IRON AGE* of July 5, 1918, pages 25 to 28.

The new method was developed by the National Malleable & Steel Castings Co., Cleveland, and the name given to the chain was Naco cast steel chain. This process of making chain not only supplied the increased demand occasioned by the war, which could not be met by the older process of making wrought iron chain, but has persisted since and is a regular product of that company.

Of late some photographs have been called to the attention of *THE IRON AGE* which present some phases in the manufacture not hitherto noted and are herewith reproduced as illustrating the size and magnitude of the chain, the method of pouring and of testing as carried out at the Cleveland plant of the company mentioned.

SEPARATE or Individual Links Are Cast, and, After Inspection, Are Set in Molds. The connecting links are then cast, producing a chain about 90 ft. long



A 90-FT. Length of Chain Ready for Testing on a Special Anchor Chain Testing Machine. A representative pile of cast steel anchor chain is also shown

Welded Line Joints for Steel Pipe

Types of Welded Line Joints Used Today, Considered
from the Standpoints of Strength, Flow
Conditions and Economy

BY W. I. GASTON*



PRACTICAL design of welded pipe joints resolves itself into developing the full strength of the pipe itself, retaining ductility, offering minimum resistance to flow, yet designing one that is simple in design and cheap to make.

Vee Butt Joint the All-Purpose Joint

The open single vee butt weld, Fig. 2, meets the requirements enumerated above. It is the type of weld most extensively used for steel pipe and is the standard welded line joint. It is easy to make, of low cost, and comprehensive tests on full-sized specimens of all sizes of pipe commonly welded have shown it to be the strongest. This type of joint can be recommended for standard, extra heavy and double extra heavy steel or wrought iron pipe for all pressures and services. Pipe to be joined by this weld is frequently supplied by the manufacturer with ends machine-beveled as shown in Fig. 1. Note that the bevel does not extend to the inner wall of the pipe; a flat portion about 1/16 in. wide is left to facilitate lining up and to form a "bottom" for the penetrating flame. It also serves to strengthen the edge during transit and handling before welding.

Square Ends Preferred on Thin Walls

When pipe is lined up for welding, a space S (Fig. 1) should be left between pipe ends to allow them to draw together as the cooling metal contracts, thus eliminating the possibility of overlapping edges or residual stresses. No allowance need be made for this spacing in laying out a piping system, as the overall length will be true within reasonable construction tolerance after welding. To add an extra factor of safety, the weld is usually built up or reinforced about one-fourth of the wall thickness, as shown in Fig. 2. This reinforcement should slope gradually from the center down to the surface of the pipe along the sides of the weld. The width of the weld should ordinarily be about $2\frac{1}{2}$ times the thickness of the pipe wall. In executing this type of joint, fusion to the depth indicated in Fig. 2 should be obtained, care being exercised that molten metal reaches the extreme bottom, or "root," of the joint.

The open square butt weld, Fig. 3, is used

for the smaller sizes of pipe, with which sufficient penetration, due to the melting of the steel with the blowpipe flame, can be obtained without beveling. It is in general use for pipe having a wall thickness of from 3/16 in. to 5/16 in. The reinforcement is usually made much heavier than when the open single vee butt weld is used to compensate for a possible lack of penetration. Full penetration is difficult to obtain regularly without allowing the fluid metal to protrude beyond the inside wall of the pipe, when this type of joint is made. Open square butt weld is recommended for standard pipe up to $2\frac{1}{2}$ in., extra heavy up to $1\frac{1}{2}$ in., and for all pipe having a wall thickness of 3/16 in. or less, for all services.

For some services carrying extremely low working pressures, not subject to any appreciable expansion, contraction or bending stresses, this type of weld may be used for standard pipe larger than $2\frac{1}{2}$ in. diameter. For such purposes pipe with a maximum wall thickness of

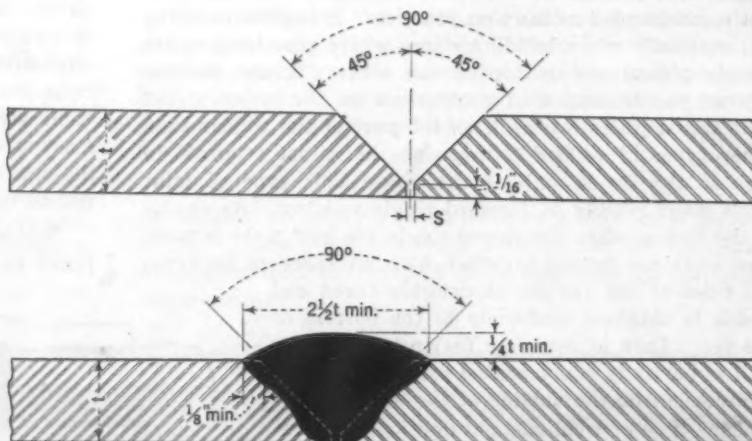


Fig. 1 and 2—Single Vee Butt Joint, as Lined Up and After Welding

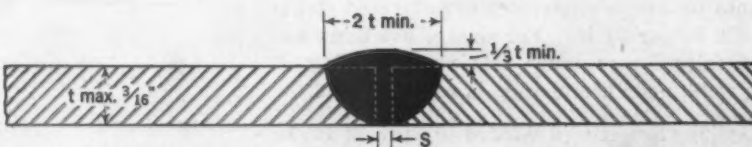


Fig. 3—Open Butt Joint, Square Ends, for Thin Wall Pipe

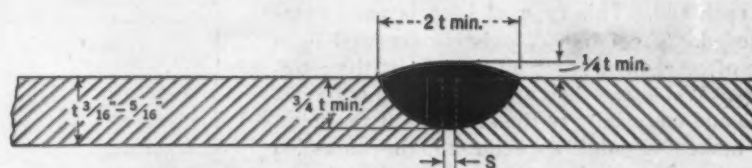


Fig. 4—Open Butt Joint with Partial Penetration, Suitable Only for Pipe Carrying Negligible Stresses and Pressures

*Technical publicity department, Linde Air Products Co., New York.

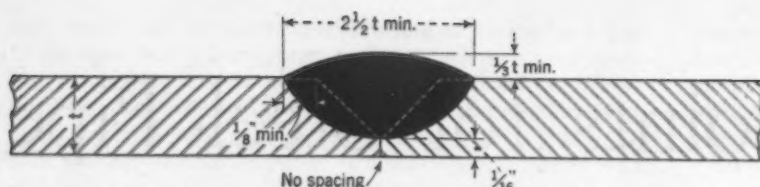


Fig. 5—Closed Vee Butt Weld Handy for Vertical Risers and Is Satisfactory for Moderate Pressures



Fig. 6—Calking a Screwed Joint Should Be Done with the Minimum Amount of Filler Metal

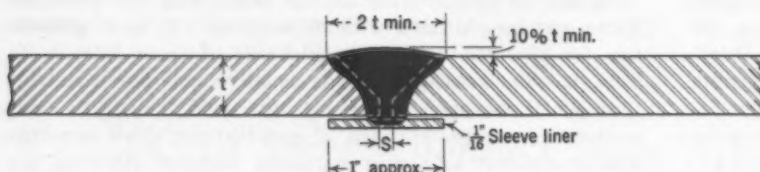


Fig. 7—Liner of Thin Metal Obstructs Flow of Material in the Pipe Less Than Protruding Icicles of Metal

5/16 in. may be welded without previous chamfering of the ends, sufficient weld depth penetration being secured with the flame to answer the requirements, as shown in Fig. 4.

Closed Vee Usable for Low Pressure Work

The closed single vee butt weld shown in Fig. 5 is sometimes used because of certain advantages, although it is not recommended as the best practice. It facilitates lining up, especially when building risers where pipe lengths are simply placed one on top of the other. It also insures against the formation of protrusions on the inside of the pipe and requires less skill on the part of the welder than other types of welded joints, since he is not required to fuse to the inside wall of the pipe. This type of joint lends itself readily to forward ripple welding. As shown in the figure, when the closed single vee butt weld is used, pipe ends are butted together with no space in between, the sides of the vee are thoroughly fused and fusion is obtained uniformly to the bottom of the vee. Lack of complete fusion to the inner wall is partially compensated for by heavy reinforcement on the outside of the weld.

This type of weld will not develop the maximum strength of the pipe, but does have a strength comparable to the usual mechanical joints. It may be used for pipe in sizes up to 12 in., and for pressure and service requirements up to the equivalent of saturated steam at 250 lb. per sq. in. For sizes above 6 in., and especially for pressure services, reheating of the weld, upon completion, is recommended.

Couplings Sometimes Welded to Prevent Leaks

Welded couplings, Fig. 6, use an ordinary threaded joint. Fillet welds encircle the pipe at each end. This type of joint is not recommended. The joints of existing screwed lines are often caulked tight by welding at the couplings. Welds are then used mainly as seals but also add materially to the strength of the joint. It makes a joint superior to the threaded coupling, inasmuch as it is stronger and permanently tight, but it is costly, requiring a coupling, the labor of threading, the labor of

tightening up and two welds. The inside of the pipe is not smooth and therefore does not have maximum flow characteristics.

If the welds are intended merely to seal the joint they may be very light, but if additional strength is required, the fillets should be increased in size until their dimensions are approximately the pipe wall thickness, as shown in Fig. 6, the filter metal should slope gradually from the end of the coupling down to the pipe wall.

Use of Liners

A type of joint that is in the process of development is the open single vee butt weld with thin liner (Fig. 7). This joint consists of the standard open single vee butt weld backed up with a thin, sheet steel liner which is fused in the welding operation to the bottom of the weld. This joint has been designed to enable even an operator of limited experience to produce a weld free from protrusions on the inside of the pipe, yet thoroughly fused to the bottom of the vee, and to enable an operator of average ability to produce more easily and quickly a weld of maximum strength.

Two types of special reinforced joints are shown in Fig. 8 and 9. Some authorities maintain that such reinforcements are never necessary with properly made welded butt joints, regardless of the service for which they are intended, and such reinforcements are not generally recommended. However, they are frequently used for river crossings and in piping systems where the joints will certainly be subjected to excessive vibration and bending stresses. The bar reinforcement, Fig. 8, is ordinarily used only for the larger sizes of pipe. It consists of straps welded across the joint at intervals around the circumference. The straps are either bent or ground to clear the bead on the outside of the pipe. To be of sufficient strength against bending, the straps should be at least as thick as the pipe wall and one-third to one-fourth the pipe diameter in width. Spacing between straps should not be more than 8 in.

Welded split sleeves, Fig. 9, are used for the same purposes as the bar reinforcement shown in Fig. 8, but on

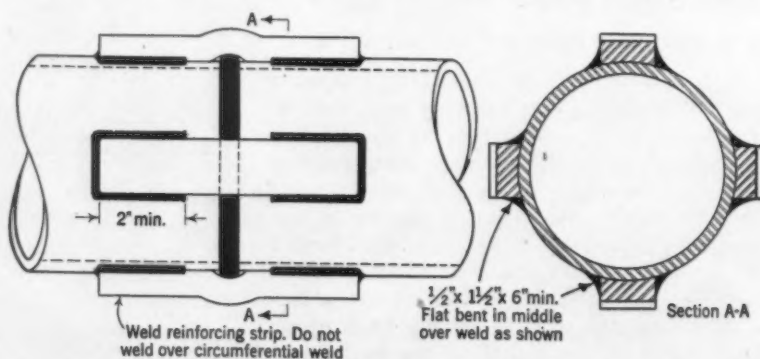
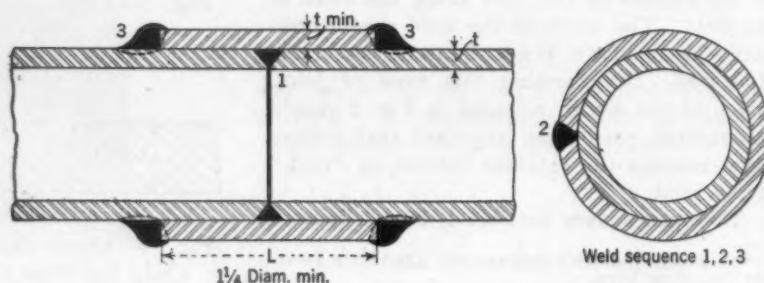


Fig. 8 and 9—Joints May Be Reinforced by a Series of Straps or a Split Sleeve



smaller sizes. When this type of joint is used, a flush weld (that is, a weld with no reinforcement) is used for making the joint to be braced. A short section of pipe of larger diameter than the pipe to be reinforced is split either longitudinally on one side and slipped over the pipe end before welding or split in halves, placed around the completed joint, tacked and welded longitudinally and at the ends. The reinforcing sleeve should fit closely and have a minimum length of $1\frac{1}{4}$ times the nominal diameter of the pipe to be reinforced. At least $\frac{1}{8}$ in. space should

be allowed at the bottom of the vee for the longitudinal weld (or welds) in order that the contraction of the weld metal may draw the sleeve tightly around the joint.

To secure maximum strength in the foregoing joint designs, all of the butt welds should be thoroughly fused to the joint edges and should extend completely to the bottom of the vee. All fillet welds should be thoroughly fused to the root. All welds should be of sound metal, free from laps, gas pockets or other defects. The bare pipe ends, before welding, should be clean, free of grease, dirt, scale, rust or bituminous compounds.

H-Sections Used for Piles to Support Building on Made Ground

BY F. H. FRANKLAND*

RECENTLY at Oakland, Cal., a contract was let by the city for a new steel frame building to be used as a garage. This is a one-story industrial type building and is to be built on recently-filled tide flats. Commissioner Frank Colburn is quoted to the effect that this building will be supported by steel piling.

Steel piling usually connotes steel sheet-piling, while in the instance above noted we find that the piling is to be of H-sections such as are used for columns in steel frame buildings. These H-sections will be driven in the same manner as any other type of piling and tested in the same manner so as to insure a proper foundation for the building.

Usually, after piles are driven for foundations, a concrete footing is poured to form a cap which in turn supports the column bases. In this case, however, the steel column will be connected directly to the steel pile in the same manner that multiple tier column splices are made in steel frames. Thus we have a steel H-column properly spliced and carrying the steel frame of the superstructure and this column reaches into the earth to a secure footing without the aid of any other materials.

The question will probably arise as to whether this is an innovation or not. In buildings this may possibly be true, but it is a system which has been in use for bridges for more than 25 years. There can be no better test for piling than its use in a bridge where it is subject to constantly changing loads, sudden impacts, atmospheric

changes, floods and ice jams, and we find them coming through these tests with a wonderful record. Recently two new bridges have been built in Monterey County, Cal., using this type of construction—not only sound but economical engineering.

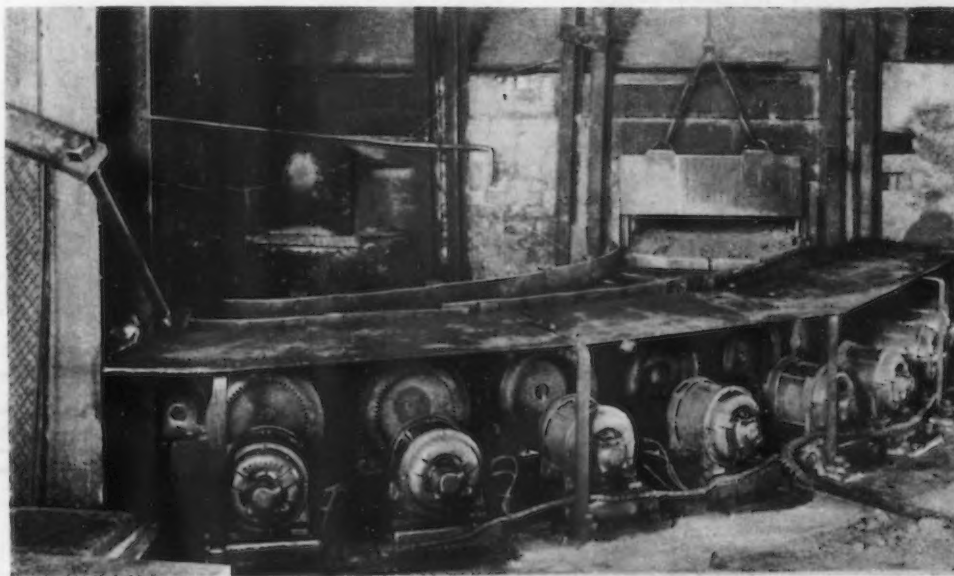
In June, 1929, the Bethlehem Steel Co. ran some tests of H-piling at a site on the estuary at Oakland. After these piles had been driven, two 100-ton hydraulic jacks were placed on top of one of the piles and a total load of 164 tons was placed on it. This caused the pile to fail by crippling of the flanges directly under the jacks. This pile was an 8-in., 32-lb. H-section and analysis will show that the stress attained reached the elastic limit of the steel. The extra penetration under this great pressure was negligible. When one considers that this pile would be called on to carry a load of not more than 40 tons in actual service it can easily be seen that a steel beam driven as a pile may be used with safety for foundation work.

Quite naturally the question of corrosion of the steel piling will arise. Steel piling immersed in fresh water and soil for 25 yr. has shown but 3 per cent decrease in sectional area. There are many rust preventives on the market with which the piling may be pointed before driving, thus retarding corrosion still further.

Recently at Seaside, Cal., steel piers reaching out as far as 1500 ft. into the ocean have been built on H-column piling. These piers are being built by the oil companies to support their oil derricks while they drill for oil under the ocean bed.

*Director of engineering service. American Institute of Steel Construction, New York.

TO convey billets to a mill facing at right angles to the furnace door eight rollers in the table were provided with individual motor drive. Type AA Reliance induction motors furnished by the Reliance Electric & Engineering Co., Cleveland, were used, the drive being through a pinion to an internal spur gear. All motors are controlled through a single starter.



Relocated Equipment Boosts Output

Chicago Foundry Featured by Lower Labor Costs and Easy Movement of Products—Adopts Methods of Specialized Plants

BY ROGERS A. FISKE*

FREQUENT changes of patterns for numerous short runs have not checked the W. A. Jones Foundry & Machine Co., Chicago, in its determination to lower cost and to speed production through the adoption of equipment and methods in use in highly specialized production foundries. This company has found that over 70 per cent of its molds can be made with the use of a sandslinger and molding machines, though it is seldom that a machine will operate a full day without changes of patterns. In fact, the average for the shop is three pattern changes a day per machine. Ninety per cent of the castings made are for this company's products, which are widely diversified, both as to ultimate use and as to range of sizes. Job work requires about 10 per cent of the foundry capacity.

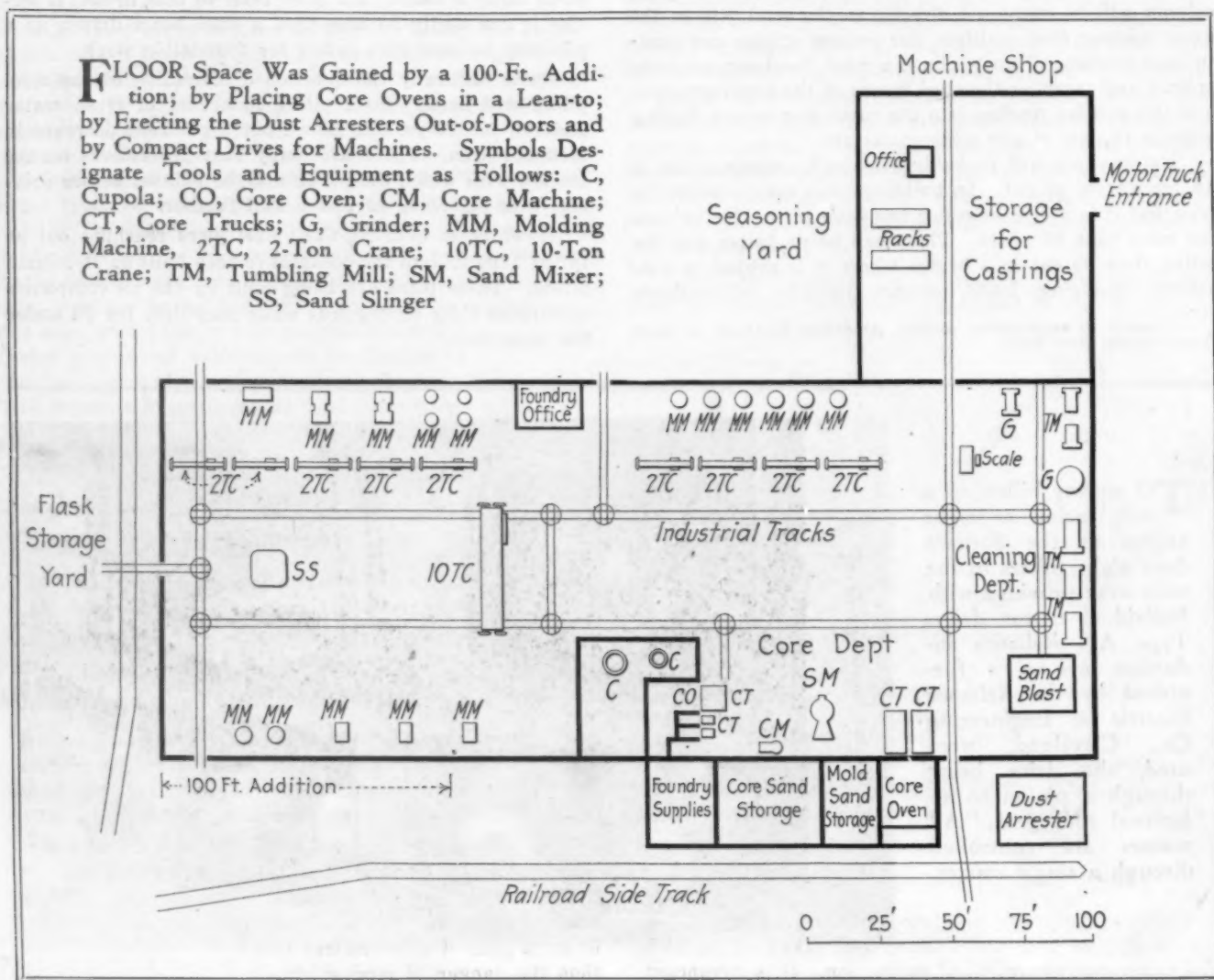
The plan to rearrange the plant was put in operation

*Western editor, THE IRON AGE.

first by the construction of a 100-ft. extension. Special attention was given to the location of equipment and the transport of products. Improved machinery was installed. A method for the control of castings needed to meet machine shop schedules not only simplified the work of assembling finished products, but aided in holding the machine shop to schedules and also made for more orderly flow of production orders through the foundry.

The net results are now coming to light in the shape of less use of manual labor, increased production and lower cost of output.

Among the first steps taken was to rearrange the active floor space so that material would move in an orderly way without congestion. The core shop, which was located in the south bay, was rearranged and additional space was provided. The sandslinger, which formerly stood in the

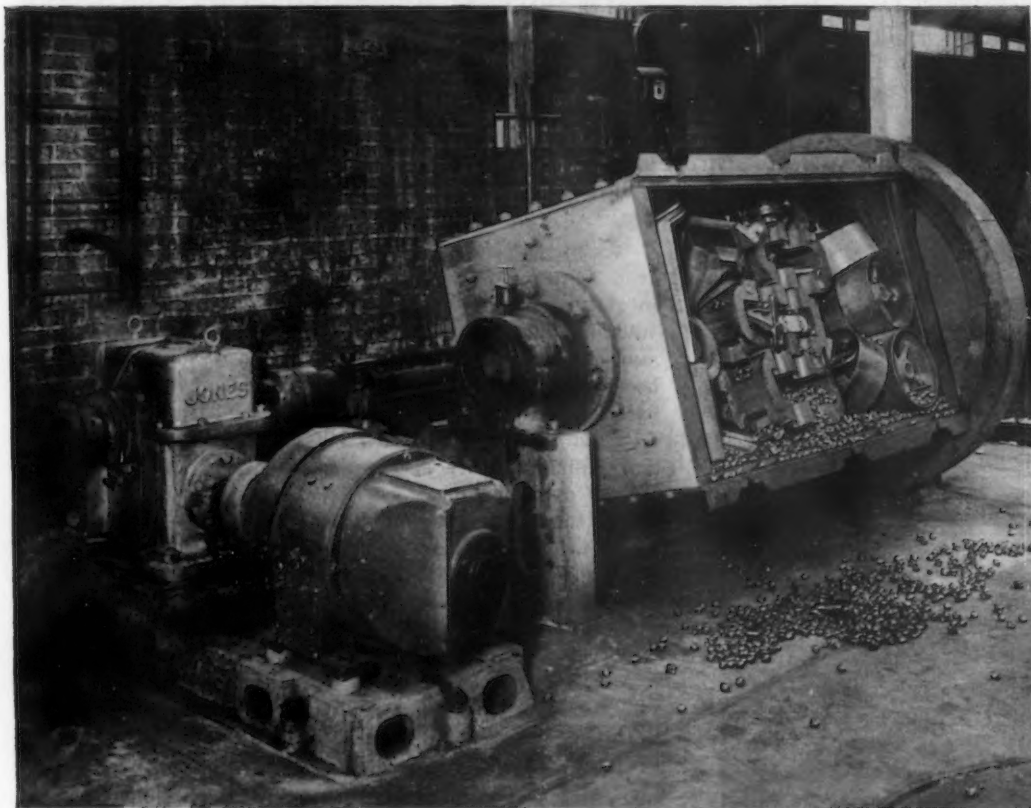


main bay near the cupolas, was moved down the main bay near the end of the new 100-ft. extension.

Small molds are made on machines placed in the side bays. Rough castings all move in one direction to the cleaning department. Raw materials are centrally located and are prepared for use and transported by modern methods. Machine drives were given special consideration as to the floor area occupied, with resultant saving of work

that this work was performed when this shop was at the height of one of the busiest periods in its history.

As has been pointed out, this foundry produces a wide variety of castings with reference to the purpose for which they are to be used. It often happens that as many as four different irons are melted in a day. Therefore, close attention is given to the mixture of pig iron and scrap steel used in charging the cupolas. On this score it is



THE Half-Coupler Attached to the Speed-Reducer Shaft Will Be Used When the Sixth Tumbler Is Installed

TUMBLERS Are Driven in Pairs by a Single Motor Which Is Connected to the Two Drive Shafts Through a Speed Reducer



space. Crane, electric hoist and industrial track systems for moving materials were unified so that transfer from one to the other is most convenient. Flask equipment has been standardized, as have the containers used for moving sand and castings.

Changes Made Without Interrupting Output

These changes were started in April, 1929, and by August of that year the foundry had taken on its new dress without interruption of production. It is significant

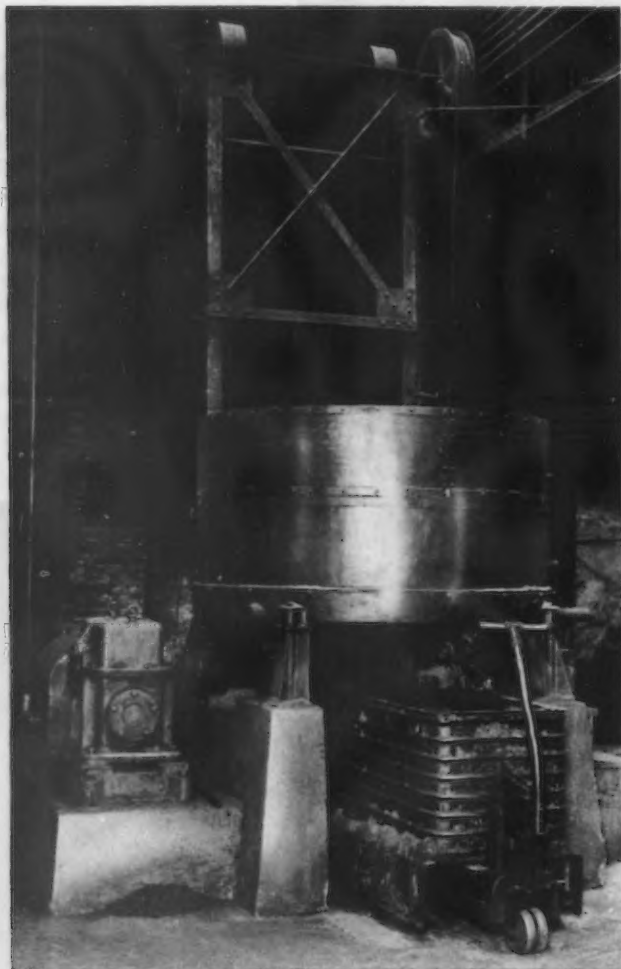
desirable to have pig iron of uniform analysis. Accordingly, rather than order iron as needed, it is the practice in this foundry to accumulate its needs and release from contract five or more cars at a time.

The silicon content is specified within an unusually narrow range, and it is expected by this buyer that an order for pig iron will be filled from one blast furnace heat. This method has its advantages, in that the number of stock piles of different iron is held to the minimum and thus the danger of mixing grades is materially reduced.

Further, this foundry does not maintain, day after day, a crew of laborers who are occasionally called on to unload a car or two of pig iron. Instead it receives iron in large quantities at less frequent intervals and has the cars unloaded by contract at a cost of about 30c. a ton.

Large Average Melt at Low Cost

The average melt in a 9-hr. day is 26 tons. Labor cost at the two cupolas is held to a low point by preparing beforehand the entire day's charge of pig iron, coke and scrap. Only two men are used for all material handling and charging operations. In the first place a sufficient number of buggies, or open-side wheelbarrows, have been



USE of a Worm Gear Speed-Reducer Drive Saves Valuable Floor Space. Sand Is Unloaded from the mixer into $\frac{1}{2}$ -yd. batch boxes

provided, so that a complete charge for the day's run can be stored on the charging floor before the cupolas are put under blast.

When the shop opens in the morning, these two men prepare the charge. Pig iron buggies are taken to the stock piles, loaded, weighed in over platform scales and raised on an elevator to the charging floor. Ample floor space is provided so that the loaded buggies of pig iron, coke and scrap may be conveniently stored until they are to be wheeled to the charging doors of the cupolas. Coke is handled in containers each with a capacity of one charge. Each charge is dumped into the cupola without rehandling. The first cupola charges are evenly spread over the cupola area, but after the filling is well under way charges are dumped into the cupola without rehandling. The convenience of this method of handling raw materials can be appreciated when it is understood that the charging floor is of ample size to store over 30 charges of pig iron and

the necessary amount of coke and scrap, and that each buggy load is a charge.

Crane ladles of 10-ton capacity each are available for spotting under the cupola spouts. Track ladles, of 2000 lb. capacity each, are used to distribute molten iron to pouring floors, which are served by narrow-gage industrial tracks.

Special Drive Provided for the Mixer

The sand mixer, of the standard design of the National Engineering Co., Chicago, is of special interest because of its drive. Much valuable floor space has been saved by connecting the motor, which is mounted on a footing standing a few inches above the floor level, to the Simpson mixer through a worm-gear speed reducer, one of the standard products made by the Jones company. Core and molding sand storage is provided in a lean-to which is convenient to the railroad switch track.

As in the case of other raw materials, sand is unloaded from railroad cars by contract. The storage bins open into the foundry room near the point where the mixer stands. Laborers, using wheelbarrows, take sand from storage to the mixer skip hoist. After a batch of sand has been prepared it is unloaded directly into corrugated steel batch boxes of $\frac{1}{2}$ -cu. yd. capacity each. These boxes stand on rigid legs so they can be handled by means of a lift truck, and they are also designed so they can be carried by the overhead crane. These boxes may also be piled one on top of the other. This feature is made use of at the mixer where a number of boxes of prepared sand may be piled and so made available for instant use. Ordinarily, however, core sand is transferred directly to the core makers by means of lift trucks. The demands of the shop are such that facing sand is promptly conveyed by the overhead crane to the molding stations.

Floor Space Carefully Conserved

When changes were planned in the foundry arrangement, much thought was given to conservation of floor space. It was found that space was available for two additional core ovens in one end of the sand storage lean-to. Accordingly the ovens were built in this lean-to with their doors flush with the wall of the main foundry core shop. The rear, or firing, ends of the ovens are convenient to the switch track on which coke is received.

Each oven is 7 ft. 6 in. high, 16 ft. long by 8 ft. 6 in. wide and is hand-fired. The inner surfaces of the oven walls are laid up with firebrick and the outer walls of common brick. Between the two courses of brick are 4 in. of cork-brick insulation. The roofs also are adequately insulated. Cores made during the day are baked at night, therefore the ovens are up to full heat for a period of about 10 hr.

Fuel consumption for the two ovens operated in this way is 350 lb. of coke for 24 hr., with a foundry melt of 26 tons a day. Extending into each oven from the coreroom floor is a track on which a car operates. Cores are transferred to these cars by an overhead crane bridge, from which is hung an electric hoist. Dry cores are conveniently transferred from the hoist to the crane in the main bay.

Flask Equipment Is Standardized

It was determined some time ago that greater production and lower cost of equipment maintenance could be realized if flask equipment were standardized. In other words, it was decided that in the future the job would have to fit the flask rather than to have a wide variety of flasks suitable to closely fit all jobs. All wooden flasks were discarded and metal flasks were substituted. Small flasks were standardized as to size, design and material. Many are circular in section and are made of cast steel.



All Charges of Pig Iron, Coke and Scrap, Each Buggy Being a Charge, Are Stored on the Charging Floor. All raw materials are prepared and the cupolas charged by two men

Flasks for large work are rectangular and are constructed of heavy cast steel ends bolted to rolled steel channel section sides. These side pieces are made of the heaviest sections procurable for given depths. Incidentally, this foundry would use still heavier channel sections if it were possible to purchase them. The cast steel flasks have been in daily use for 4 years and there have been no failures, either as to cracking or springing. The flask storage yard is reached by an industrial track which also serves the main molding floor. A stationary mast-crane is used to remove flasks from industrial cars to storage piles.

Large Molds Made by Sandslinger

An interesting development in this foundry is the use of green sand and a Beardsley & Piper Co., Chicago, sand-

slinger for the production of base castings as large as 6 ft. x 11 ft., each weighing 5000 lb. This sandslinger is set high and is designed with a 12-ft. arm, so that large flasks which are required for much of the product can be set in easy reach of the arm and large molds made without shifting the flask.

Each side floor in the north bay is fitted with a roller-bearing hand-operated crane, from which is hung a 2-ton electric hoist. The top flanges of the channel runways serve as tracks for the cranes. These channels extend beyond the main bay columns so that loads are easily transferred from the side bay to the main bay crane. Along each side of the main bay is an industrial track. Castings shaken out in the main bay or in either side bay are loaded on cars for transport in a straight line to the cleaning



Finished Castings Are Properly Identified and Stored in a Receiving Room. This practice steadies production in the foundry as well as in the machine shop and assembly departments

department. Large castings may be moved to the cleaning department by means of the overhead crane. Cross industrial tracks and turntables at convenient places provide flexible material movement on roller-bearing industrial trucks.

Truckloads of castings are spotted directly in front of the mills and an extension of this track reaches the sand blast compartment. Castings removed from the tumblers and the sand blast are loaded into empty trucks for a short movement to the grinding and chipping floor. The tumbler arrangement is of interest both as to arrangement

ture conditions only for a few minutes when first started, because the warm air drawn with the dust from the foundry room equipment soon raises the temperature in the motor house.

As previously stated, cleaned castings are moved a short distance to the grinding and chipping department. Of special interest here is the use of portable electric grinders, which are operated from a motor-generator set which transforms direct current into alternating current at 180 cycles. These grinders were furnished by the Chicago Pneumatic Tool Co., New York.



Jib-Cranes, Electric Hoists, Traveling Cranes and Industrial Tracks All Contribute to Flexible and Speedy Movement of Materials

and as to method of drive. There are five units, all manufactured by the Whiting Corporation, Harvey, Ill.

Two round tumblers, measuring 24 in. x 60 in., and three square units, measuring 36 in. x 60 in., 42 in. x 60 in., and 48 in. x 60 in., stand in a line along the east end wall and are driven in pairs. The drive ends of two tumblers have been brought face to face and a single electric motor is connected to the two tumblers through a Jones speed reducer. The fifth tumbler is placed so that a sixth unit may be paired with it, making use of the present drive.

The sand and dust collectors are of interest for the reason they have been placed in the open to the south of the foundry building. The collectors and the sand blast equipment were furnished by the W. W. Sly Co., Cleveland. The steel dust arresters, there being two, one of which serves the tumblers and the other the sand blast equipment, stand on a structural steel framework. These arresters are separated by a room in which have been placed three motor-driven blowers, one of which serves the tumblers and two the sand blast equipment.

Heat Comes from Exhaust of Power Plant

The foundry is heated by exhaust steam from the power plant and it has been found that the slight drop in temperature, due to the withdrawal of air by the blower equipment, has not in any way inconvenienced the men in the main building. The motors work under outside tempera-

After each casting is ground it is placed in a corrugated steel box with other similar castings. In other words, this is the point at which castings are sorted. These boxes stand on legs so that they are easily moved by electric lift trucks to a department which is designated as an assembly room. This space is essentially a receiving room for the machine shop. It serves as a reservoir in which castings are assembled and forwarded to the machine shop in adequate quantities and at the proper time to insure maximum efficiency in the machine department so that assembly of the products of this shop will proceed in an orderly way and at the rate which insures keeping promises made to customers.

This room serves as a receiving department for bar and forge stock as well as a storage and shipping department for castings. Marked racks are provided for box storage of small castings. Large castings are stored on platforms which stand on the floor. All materials are stored in a manner so that they can be removed quickly at minimum cost.

The changes in this foundry already show a substantial return on the investment. The relocation of equipment has greatly facilitated the movements of products, thereby increasing output through the elimination of much lost time. Orderly movement of materials has also resulted in lower labor cost. Installation of necessary modern production equipment has increased production at lower unit cost.

Furthering Business with Japan

What Needs to Be Understood, Especially in the Light that America Is Regarded as the Model Worth Copying

BY DR. LILLIAN M. GILBRETH*



IN order to supplement my meager opportunities, because of my short stay, to get first hand information about industrial and business Japan, I interviewed everybody who had such information. This article covers, therefore, material from talks with many types of people, Americans or Europeans who have lived in Japan many years as agents for American companies or as salesmen for American machines or products, representatives of our government, doctors, nurses, educators, social service workers, representatives of the Y. M. C. A. and Y. W. C. A. Men and women who have kept at one type of activity all through their years of residence in Japan and others who have changed from one line to another.

It would be impossible to give the names and due credit to all of those who have helped me, but I owe special obligation to Mr. R. F. Moss of the Truscon Steel Co., whose article on "The Economy Program" appeared in Japan Sept. 27, 1929, and to Mr. H. C. Kemball of the American Trading Co. of Japan, Ltd. It must be understood that in quoting these gentlemen and the others, they have emphasized the fact that any criticisms they have made are in the spirit of greatest liking for and friendliness to the Japanese people. It is one thing to criticize a people among whom one has lived in their own language and through their own periodicals. It is quite another to criticize them through a foreign medium. It should be understood that the material here presented is most friendly, aims to be most constructive and is presented primarily as an urge that American business and industry serve Japanese needs and become a better example.

My informants were agreed in saying that the greatest assets of the Japanese are willingness to work, a desire to learn from each other and from foreigners, patriotism, love of beauty, natural dexterity. This sub-

stantiated what I, myself, saw everywhere and gave the assurance that it was no temporary condition emphasized to impress foreign short-time engineering guests, but the usual way of life. From the prince on the platform opening the congress to the humblest 'rickshaw man, there was apparent a great desire to do one's job well, a welcome to the foreigner, a flaming love of country, an appreciation of art, and a dignity, beauty and perfection of motions which was impressive. The same thing was true from the princess in the palace to the city housewife living back of the little shop and the rural housewife to whom a tourist was a novelty.

What Checks Industrial Progress

AS for liabilities the criticisms were, too many men on a job, job done in an inefficient manner, lack of "time and cost-keeping" and unevenness in efficiency of management, that is to say, well set up work places next those much less efficiently set up and no real tying together of the whole plant.

Instead of accepting or denying these things it might be well to attempt to trace them to basic difficulties and to outline possible remedies. There is general agreement that the two things which are slowing up progress in industry and business in Japan are the family system and the caste system. These are not only closely connected with history and tradition, but with admirable traits of the Japanese people that certainly should be preserved.

Love of family, respect for ancestors and for age, willingness to make sacrifices for near and remote kin, a feeling of obligation to one's household and one's class, these are all fine things. We, who come from a people which is facing the problem of preserving family life and the home, might well hesitate to recommend drastic changes in a nation which has a far more complicated problem and is trying to solve in a few years questions which it has taken other countries centuries to solve. Yet if business and industry are to progress, every member of an organization must submit his work to measurement, prove himself efficient, accept responsibility and enter the open market in selling his services.

As for the caste system, it is im-

portant even more as it affects work than as it affects people, for if work is rated in value and attractiveness, not according to the amount of skill called for, or training necessary, but according to the caste of the man who does it, we have a real obstacle toward industrial betterment.

Time Study Work Difficult to Introduce

THE results of these basic difficulties would be certain effects on attitudes, on questions most important in business, such as unwillingness to dismiss within the family and caste and unwillingness to employ outside the family and caste and unwillingness of a man in one caste to do work done by another caste. For example, unwillingness of an engineer to do actual shopwork, run a machine, even run an automobile. This might even extend to a resistance against the accurate measurement which is fundamental to scientific management and an unwillingness for example to submit to time and cost-keeping, time and motion study, etc. These would hold back simplification and standardization and even a realization of their value.

It was along these lines that the criticisms I heard ran. Personally I felt no resistance against motion and time study or the resulting simplification of work. And there seemed every evidence in the factories I saw that the consultants and the shop men who cooperated with them had worked with and enlisted the cooperation of the workers themselves. How this could have been done without actually doing the work and then demonstrating I cannot see, which may either mean that I saw the exceptional places or that this caste system idea has been overstressed.

I did meet in many plants several members of the family active in the plant. In all these cases each one of these men seemed to me exceptionally interested in the work and taking a personal, as well as a family, pride in what was done. If there are too many men on a job, it may well be not due to inefficiency, but to the fact that there are an enormous number of people in Japan for whom employment must be provided and that they, like those of every other country, are facing the problem of technological un-

*Special correspondent for THE IRON AGE to the World Engineering Congress in Japan. Dr. Gilbreth covered the general features of the congress in the issue of Jan. 16, the industrial management movement in Japan, Jan. 23, and the practices of industrial Japan, Jan. 30.

employment and are trying to hold on to as many men as possible during the interim period, when it is to be hoped everyone can again be used.

Some Lacks Same as in United States

AGAIN it must be noted that the consultants in management work are, few of them, as yet engineers, which means that while the results are excellent as they affect the handling of the human element, especially on hand work, there is need for coordination with machines. Besides, how many industries in any country are efficient all the way through?

As for proposed remedies in industrial business, the first would be an adequate time and cost system. This would enable everyone to know where he stood, to evaluate his past and present and get some notion as to the trend of his future. It would eliminate trial and error and the guessing which is so fatal to steady industrial progress. It would lead naturally to other types of measurement and the gradual installation of scientific management as the principles were understood and the practice was adapted to the needs. This would include job analysis and personality analysis, which would naturally lead to better selection, training, placement and promotion and ultimately to discharge of useless men. Ultimately this would be supplemented by all possible shifting to jobs within the industry and to a cooperation between industries which would reduce unemployment.

One of my informants urges as an immediate measure government relief employment, a little lower paid than the usual rate for the job in order to induce looking for a regular job and employment on needed jobs like road-making. I feel I must emphasize again that this same procedure is needed in every foreign country I know and in our own country. I cannot remember one criticism made in Japan by Americans, either of our engineering congress party or of the group who had lived there for years, which did not end with "but, after all, haven't we the same thing in our own country"—this often followed by chapter and verse telling just when and where it was happening.

Needs an Extensive Health Program

IN every country the underlying causes of inefficiency from the physical standpoint have to do with inadequate housing (both in the plant and office and at home), inadequate diet, inefficient clothing and resulting poor posture and so on. When we remember that Japan is greatly overcrowded, has suffered a devastating earthquake and fire, has a great deal of rain, has a heating and clothing problem which is not yet completely solved, we can imagine that there is much to be done. As with us an extensive health program is needed. This means hospitals to act as health centers and working demonstrations.

On the mental side in every country the answer is—adequate education. We who know how inadequate our own

schools and colleges are to train people to adjust easily and succeed rapidly in industry can imagine the problem in Japan. Vocational guidance, vocational education, continuation schools, training for leisure, all need more consideration. I feel that some of these problems may be simpler than with us because of the willingness of the Japanese to work, their natural dexterity, love of beauty and adaptability. They do need thinking in terms of the good and bad points of specialization and despecialization, but then we all do.

It is difficult to say much about the emotional condition of a people to whom one is strange, even though most friendly. I heard talk of lack of persistence in putting through a job, but this might be a physical rather than an emotional complication and due to inadequate diet. Certainly Americans as well as Japanese seem lacking in endurance for long time jobs. This, several told me, was due to diet. One said that a recent investigation showed deficient vitamin content in certain foods owing to the lack of chemicals in the soil. Certainly I saw a control, stability, patience, cheerfulness and cooperation that were remarkable.

Specification for American Representatives

AS for the relation of American industry to Japan. In the first place, I feel sure that we as a people do not understand the situation in Japan, either how the people live and work, or how they think and feel. As a result we send over many who are useless or worse. Japan is no place for outdated, unprogressive people of any kind; on the other hand, it is no place for the ultra-progressive, high pressure, impatient type.

A personality specification would read something as follows: (1) Physically: older, more dignified, more impressive; healthy, able to stand new diet, dampness, inconveniences, many and unexpected changes in mode of living. (2) Mentally: educated, able to teach, preferably able to speak Japanese, but certainly able to learn it rapidly; adaptable, openminded, convinced that likenesses are more important than differences. (3) Emotionally: stable, controlled, with a good sense of humor, curious and interested in many things, liking to practice as well as to preach, glad to copy or to be copied, with a real love of people in general, and the Japanese people in particular, and a willingness to be patient and wait for results. (4) Sartorially: correct and impressive, conventional, yet adaptable.

This means that we need here in America adequate information as to conditions in Japan. Training schools for all who are to work there, study as to what needs to be sent to our men and women representing us there, to make it possible for them to live and work effectively and contentedly. These people tell me they need more information as to what is happening in their fields at home, better trade

catalogs, for example, thought through and written specially for the need of the foreign agent or salesman with standardized numbers, symbols, etc., to simplify ordering and cabling.

When I spoke of reports from the home office as well as to the home office, sabbatical years with substitutes, so that one might come home to be reeducated, adult education on the job, thinking through in adaptable products and final need in the factory to help the man on the job and adequate use of men who come back to America as sources of information of conditions and needs in Japan, they seem to feel I have found some of the answers to their problems.

Study of Japanese Needs

NO job should be undertaken in Japan without an adequate job specification. No machine should be sent without knowing the need of the market, no man should be sent without analyzing his job to see what it really calls for and without his being analyzed to see what he can offer in skill and will need in satisfaction. Some of this is being done and the results certainly warrant the effort. But much more is needed.

A certain amount of such work can undoubtedly be done for American business and industry through government agencies and with an engineer President, keenly interested and enthusiastic, much is sure to be done. But a certain amount of the specialized work will always have to be done by the various industries and businesses involved, and the sooner this is done the better. The needs are apparent, plans to meet them should not be difficult to make and the carrying through of these plans should be started at once.

Besides his duty as a leader in business and industry, every American has a duty as a citizen—for the welfare of Japan, of America, of the world—to realize that Japan is worthy of study. We should recognize likenesses as well as differences and study both to find the underlying reasons and the relative values. We should be willing to acknowledge superiority as well as inferiority and to appreciate as well as criticize.

The Japanese are clever enough and wise enough to observe not only what we say but what we do and think and feel, and our feeling is of course by far the most important thing. They have felt for us a great admiration and liking; this is at the basis of their copying. They have listened to what we have said in this respect and often believed us. We speak very glibly about "the brotherhood of man," "class equality," "the superiority of the man who can do, to the man who can only talk about it." We must demonstrate as well as talk if we expect to be copied adequately.

It is a big job we have undertaken to act as model for business and industrial Japan. Everyone in our group felt, as we came home, that if we make the model right, the copy can take care of itself.

Drawing Chrome-Nickel Alloy Utensils

Allegheny Metal Used for Hotel, Household and Hospital Ware
Requires High Heat Treatment and Special Care in Processing

WITH high chrome-nickel alloy steel spreading into many and diverse fields of manufacture, it has probably found no more practical and successful application than in culinary utensils for hotels, restaurants and households and for equipment in hospitals. Resistance to rust and corrosion, freedom from oxides or verdigris and the ease with which it may be cleaned are factors, which, added to long service without damage from rough handling, render it highly desirable.

Manufacture of high chrome-nickel alloy utensils has been added to the production of a number of culinary equipment makers. Among these the Lalance & Grosjean Mfg. Co., Woodhaven, N. Y., is a large and long established manufacturer that has been successful in drawing and finishing a chrome bearing alloy. All the company's Crusader brand utensils are made from Allegheny metal of the Allegheny Steel Co., Brackenridge, Pa., an alloy with an analysis of Cr 17 to 20 per cent, Ni 7 to 10 per cent, C under 0.20 per cent, Mn under 0.50 per cent, Si under 0.50 per cent, S and P under 0.25 per cent.

Such utensils sell to the consumer at several times the price of aluminum, enameled or ordinary cast iron ware, but the metal is tough and not so easily handled as ordinary steel. Without the saving in weight of aluminum, it has however long life under severe usage.

At the first step in converting a sheet into a pot, pan or other utensil, the cost is greater than with ordinary steel sheets, for blanking out the large circles, later to be drawn, requires a special tool steel, usually of high manganese, for the die rings. The remaining portion of the sheet, generally of value only as scrap is worth 2c. to 2.25c. per lb. and losses in blanking these circles range up to 23 per cent of the sheet, depending upon the size and shape of the article to be drawn.

White Pickled Instead of Polished Sheets

In drawing Allegheny metal into utensils, a white pickled finish sheet is used, as a polished surface would be completely removed by the drawing and annealing. When a shallow pan is to be made, which can be completed with one draw, a sheet polished on one side and white pickled on the other is used, as the high polish can be brought back by a final buffing. Sheets range from Nos. 14 and 16 gage for heavy hotel, restaurant and some hospital utensils to Nos. 18, 20

and 22 gage for the household equipment.

An ordinary cylindrical pot or other container will be drawn about 3 in. on one pull, after which annealing follows for another draw. While the number of times a utensil is annealed in process of manufacture depends upon the gage of the sheet being used and the severity of the draw, the high chrome-nickel alloy requires more annealing than an ordinary steel sheet and will usually be heat treated five or six times during drawing, in-

face before going to the beading machine, where the edge is turned under.

Finished by Grinding Four Times

Final finishing of each utensil requires considerable care. An ordinary steel utensil when completely formed would be japanned, enameled or tin coated to prevent corrosion, but while a coating is unnecessary on the high chrome-nickel alloy, a bright finish, easy to clean and quite permanent must be obtained by grinding and polishing.



The Kitchen of a New Restaurant Equipped with High Chrome-Nickel Utensils

stead of three or four times with ordinary steel.

Heat Treated at 1900 to 1950 Deg.

Heat treatment is also higher, for while 1300 to 1350 deg. Fahr. generally suffices for ordinary steel sheets, the high chrome-nickel alloy is subjected to 1900 to 1950 deg. Fahr., for about 3¼ min., depending upon the thickness of the section. Maintenance of such temperature in the furnace over long periods brings attendant difficulties with rails and framework of the oven car and the Lalance & Grosjean company is now investigating the possible substitution of some highly heat-resistant metal for the purpose.

After the final draw, the roughly formed utensil makes another trip to the annealing furnace where it is again heated to 1900 or 1950 deg., after which the flange left after drawing is trimmed evenly and it is placed over a die on a spinning lathe to remove imperfections in the sur-

Each article is ground four separate times inside and outside, Nos. 60, 120, 180 and 200 emery being successively used, glued to cloth wheels. The wear on these is considerable and continual replacement is necessary, so that long racks in the grinding room are always well stocked with a fresh supply. Following the final grinding, each utensil is polished by hand with a cloth dipped in a compound containing powdered pumice, after which it is inspected.

Welding To Be Used for Attachments

Handles and other accessories to be attached after completion of an article are at present riveted in place at the Lalance & Grosjean plant, but the company is preparing to use oxy-acetylene welding more widely for this purpose. In the manufacture of large milk containers of ordinary steel, which are dipped in tin after completion, electric arc welding is used on the collars of the covers. Recently the company, as an experi-

ment, made a standard 40-qt. milk container of Allegheny metal. The finished product was satisfactory in every respect but its cost would have been about 17 times higher to the consumer than the ordinary tin coated container of the same size and shape. However, this was on the basis of the cost of the experimental can and quantity production would considerably reduce this cost, which would be further offset by the permanency of the Allegheny metal container.

The high chrome-nickel products of the company are divided into three groups; for hotels, for household use and for hospitals. The hotel and household equipment differs only in the size of the utensils and the gage of the sheets used. Heavy gage sheets are generally drawn into hospital

ware, which includes basins of various depths, cups, irrigators, jars, serum kettles, pails and various sized trays. The hotel ware includes bowls of various sizes, cereal cookers, pudding, sauce and frying pans, pans for steam tables, pots of various sizes, trays for cafeterias and other purposes and beverage shakers. Large kitchen spoons and forks are also stamped from the big chrome-nickel alloy.

Added to the ease with which the alloy may be cleaned, its long life through resistance to denting, scratching or bending and its desirability for cooking is the fact that it is impervious to food acids, which permits storing foods including fish, meat, butter and other perishable edibles in containers of the metal.

Ryerson Completes 40 Per Cent Addition at Detroit

A new heated building with increased facilities for storing and dispatching has been completed recently by Joseph T. Ryerson & Son, Inc., at 1600 East Euclid Avenue, Detroit. This addition marks the fourth large expansion program of the Ryerson company during its 12 years in the Detroit area.

The new unit is 120 x 300 ft., including five bays and a large transfer bay at one end with facilities for the inside loading of freight cars. Five cranes will move material from all parts of the building to the transfer bay, where another crane loads it on cars. This equipment, built for both large capacities and greater speed, facilitates dispatching rush shipments.

Truck loading facilities are provided by a driveway through the center of the building. The driveway is 20 ft. wide and permits the loading of five trucks, one under each of the five cranes, all at the same time. Trucks are also loaded under the crane in the transfer bay. Industrial tracks, paved into the driveway in the transfer bay, enable the transferring of stock from this building to any part of the plant for combination loading. The floor of the building is on the same level as the railroad car floor, thereby forming a dock at the railroad tracks which simplifies the moving of material to and from the cars.

All kinds of sheets, Allegheny Metal, Ascoloy, hot and cold-rolled strip steel, bands, and other steels that require exceptional care will be stored in this 36,000 sq. ft. of heated warehouse space. Unit heaters are installed to circulate the heat and maintain an even temperature throughout the building at all times of the year.

Plans for increased stocks are well under way, the most recent additions including over 500 sizes of cold-rolled steel, special sheets, mild steel bars and bands, structural shapes, plates, reinforcing bars and other allied products. Special grades and sizes of these stocks are being carried to meet individual requirements of various indus-

tries. New lines of metal-working machinery and small tools have also enlarged the scope of the Ryerson machinery sales.

Excellent facilities are available for customers who wish to call for material, an entire span in the new unit being devoted to this service. Pick-up orders are followed through by a separate office and plant force to prevent confusion with delivery orders. In this way an unusually prompt service is maintained in supplying customers' trucks.

An open span 90 x 350 ft. has been

COMING MEETINGS FEBRUARY

American Society for Steel Treating. Feb. 7 and 8. Semi-annual meeting, Pennsylvania Hotel, New York. W. H. Elsenman, 7016 Euclid Avenue, Cleveland, secretary.

American Refractories Institute. Feb. 16 to 21. Joint meeting with American Ceramic Society, Royal York Hotel, Toronto. Dorothy A. Texter, 2218 Oliver Building, Pittsburgh, secretary.

American Institute of Mining and Metallurgical Engineers. Feb. 17 to 20. Annual meeting, 29 West Thirty-ninth Street, New York. H. Foster Bain, 29 West Thirty-ninth Street, New York, secretary.

MARCH

National Management Congress. March 3 to 5. Hotel Stevens, Chicago. Sponsored by management division of American Society of Mechanical Engineers, American Management Association, Society of Industrial Engineers and National Association of Cost Accountants.

American Society of Mechanical Engineers. March 5 to 7. Materials handling meeting, Stevens Hotel, Chicago. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

Cleveland Engineering Society. March 14 and 15. Fiftieth anniversary, banquet at Hotel Hollenden.

American Society for Testing Materials. March 18 to 21. Spring group committee meetings, Book-Cadillac Hotel, Detroit. C. L. Warwick, 1315 Spruce Street, Philadelphia, secretary.

developed between the new unit and old buildings, for storing and dispatching reinforcing bars, some contractors' supplies and other material not affected by the weather. This area is served by both the Michigan Central and Grand Trunk railroads on separate sidings. Twenty-six carloads of steel can now be handled at one time on the Ryerson property.

With this addition the company has the largest steel service plant and the most diversified stocks of steel and allied products in the Detroit area. In addition to the Detroit unit, the Ryerson company is serving eight other centers, with plants at Chicago, St. Louis, Cincinnati, Cleveland, Buffalo, Philadelphia, New York and Boston.

Counterbore Company Shows Gain in Sales Volume

The Eclipse Counterbore Co., Detroit, in 1929 showed gains of approximately 25 per cent in both volume and profit over 1928. An expansion program begun in 1929, which resulted in an increase of 75 per cent in floor space and 65 per cent in machine capacity, has been completed, placing the company in a position to render prompter service both in its engineering department and the manufacture of special and standard boring and counterboring tools. At the annual meeting of stockholders Judson Bradway, R. G. Michell, Wesson Seyburn and M. M. Michell were reelected directors and the directors elected Mr. Bradway president, Mr. Seyburn vice-president and R. G. Michell, secretary-treasurer and general manager. A. C. Warn continues as assistant general manager in charge of production and Mr. Seyburn was reappointed director of sales.

Die and Special Tool Builders Elect Officers

At a meeting of the National Die and Special Tool Builders Association, held recently in Chicago, M. P. Heinze, Heinze-Petzelt Machine Co., Chicago, was elected president. R. Krasberg, Krasberg Tool & Mfg. Co., Chicago, is vice-president, Miles Irmis, Superior Tool & Stamping Co., is treasurer and George R. Tuthill, 40 North Wells Street, Chicago, is secretary.

The board of directors includes: Franz K. Krag, Franz K. Krag Co.; Alex Hillstrom, Chicago Tool Co.; H. A. Laystrom, Quality Hardware & Machine Co.; Irvin S. Berkman, Berkman Mfg. Co.; M. C. Bachner, Plymouth Mfg. Co.; S. R. Swenson, Midwestern Tool & Engineering Co.; Daniel Szantay, Sinko Tool & Mfg. Co.; John Winzler, Reliance Die & Stamping Co.; William F. Orth, William F. Orth Co.; Christ Scheel, Service Tool & Die Co., and T. E. Barker, Accurate Steel Treating Co., all of Chicago.

Pneumatic Grinder for Die Work

Speeds in Excess of 40,000 R.P.M. Assure Efficient Operation with Very Small Grinding Wheels

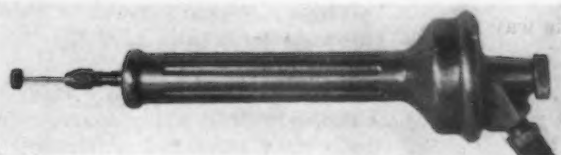
FOR finishing irregular surfaces and small cavities in dies and metal patterns, the Madison-Kipp Corporation, Madison, Wis., is offering the high-speed air grinder here pictured.

The spindle of the machine rotates at a speed in excess of 40,000 r.p.m. At the upper end, the spindle is mounted in a ball bearing provided with seals that retain a sufficient sup-



THIS Pneumatic Grinder Is 8 1/4 In. Long and Its Barrel Is Not Much Thicker Than a Man's Finger. The grinding wheels, which may be of various forms, may be driven at a speed of 40,000 r.p.m. or greater

CORRECTING Distortions Produced in Hardening Are Among the Various Uses for the Tool



A wide range of grinding wheels, as well as different forms of polishing wheels, can be used on the machine. The wheels can be driven at sufficiently high speeds for efficient operation.

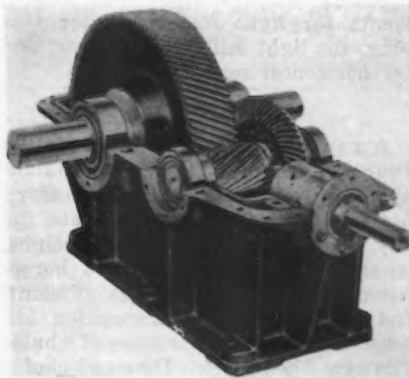
The Kipp air grinder is held and used somewhat the same as a fountain pen, which it approximates in size, the over-all length being 8 1/4 in. and the diameter of the barrel a little thicker than a man's finger. Its weight is 12 oz. In the housing at the upper end of the grinder, there is a turbine wheel carried on the spindle, and above this housing is a knurled knob, a quarter turn of which opens or closes the port that admits compressed air to the turbine.

Air thus admitted to the turbine wheel housing is distributed through four equally-spaced ports and then passes through inclined nozzles to impinge against closely spaced teeth on the turbine wheel. Close spacing of these teeth is one of the factors assuring smooth and quiet operation of the grinder under the high rotative speeds which are necessary to drive very small grinding wheels at surface speeds in excess of 5000 ft. per min. After escaping from the turbine wheel, the air passes down through the barrel of the grinder and escapes through exhaust ports at the lower end, blowing away the grindings and abrasive dust which would otherwise tend to accumulate in the cavity being ground.

ply of lubricant to last for a period of six months' operation. The lower end of the spindle is mounted in a bronze bushing. An axial hole is drilled in the spindle and fitted with a wick that holds sufficient lubricant to provide for one hour's operation without oiling. Centrifugal force throws this lubricant out from the wick through a cross-hole in the spindle leading to the bearing.

New Line of Right-Angle Drive Speed Reducers

A LINE of speed reducers with the shafts at 90 deg., either vertical or horizontal, has been brought out by the Falk Corporation, Milwaukee.



Both Horizontal and Vertical Shaft Units Are Made

As shown in the illustration, a combination of single helical and spiral bevel gears is used. It is stated by the makers that single helical gears for the final reduction are easier to assemble than herringbone gears and that an accurately cut single helical gear in combination with a high grade spiral bevel provides a quiet, cool running unit having an initial efficiency in excess of 95 per cent.

Reversible construction of gears and shafts is a feature. When gears become worn the shafts can be turned end for end to permit using the opposite and unworn sides of the teeth. Falk parallel shaft reducers also embody this feature.

Ratings on the new line range from 1/16 hp. per 100 r.p.m. to 565 hp. at 100 r.p.m. Ratios range from 15 to 1 to 518 to 1. A self-contained splash lubricating system maintains a film of oil on the working faces of the gear teeth, oil being also continuously circulated through the bearings. A full line of welded steel motor beds has been developed for these reducers.

Tongs for Use on Both Pipe and Fittings

CHAIN tongs fitted for use on both pipe and fittings, thus providing two tools in one, have been placed on the market by J. H. Williams & Co., Buffalo.

A feature is the arrangement of the jaw, which has a V-recess to permit quick and positive grip on fittings. No change in the tongs is necessary in applying them to the pipe or fittings, and the jaws are reversible so that when the teeth first used become worn the jaw may be turned end for end, thus doubling the life of the tool. All parts are interchangeable.



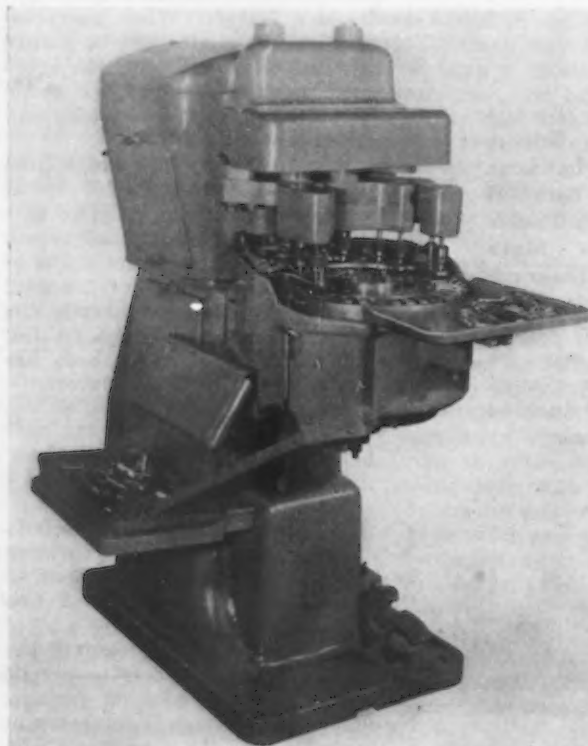
The V-Recess in the Jaws Assures Positive Grip on Fittings

The tongs are made in seven sizes, covering fittings from 1/4 to 12 in., and with either cable or flat chain. Weights range from 1 1/4 to 55 lb., while in length the tool ranges from 13 1/4 to 64 1/2 in.

The Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, has been making an investigation of foreign markets for American sawmill and wood-working machinery and in this connection has recently published Trade Information Bulletin No. 670 entitled "Marketing Sawmill and Wood-working Machinery in Australia, New Zealand, the Netherlands, East Indies, the Philippine Islands and British Malaya." It may be obtained for 10c. from Superintendent of Documents, Government Printing Office, Washington.

New Automatic Multiple-Spindle Tapping Machine

ENTIRELY automatic in operation except for loading the work-carrier, and designed to use from 1 to 10 spindles, the machine here shown is offered by the Globe Tapping Machine Co., 488 John Street, Bridgeport, Conn., for high-production tapping of a wide variety of pieces. By means of



EQUIPPED

with 10 Spindles. This Dial Feed Automatic Tapper Countersinks Three Holes in Each of the Metal Stampings and Taps Two of Those Holes. Two stampings are countersunk and tapped simultaneously, and production is 60 pieces per min., or 3600 per hr.

attachments, light drilling and countersinking, screw-driving, staking and other operations may also be done.

In tapping $\frac{1}{4}$ -in. steel, four $\frac{3}{8}$ -in. standard taps may be used; on lighter material the capacity is for ten 10-32 taps. The maximum size of pieces handled is 6 x 12 in., $\frac{3}{8}$ -in. thick.

The machine is similar to the company's former model, except that it is designed for 10 spindles, has the driving motor located in the base, and has a clutch type driven pulley, the clutch being engaged and disengaged by foot treadle. An automatic tripping mechanism has also been added. This member connects with the clutch and, in stopping the machine automatically in case of interference with the indexing of the work carrier, it serves to protect the feeding mechanism and the taps.

The driving motor, either 1 or 2 hp. with speed of 1750 r.p.m., is mounted on a tilting plate in the base of the machine, and means are provided for convenient adjustment of belt tension. The spindles are driven positively. From the motor, the drive is by belt to the clutch pulley at the rear of the tapping head, and then through a hardened and ground nickel steel ball-bearing worm, a bronze worm gear, rack and pinion and intermediate spur gears. The spindles may be adjusted as to location by moving the intermediate spur gears and the spindles.

They are arranged so that the tap follows its own lead, permitting the use of taps of different sizes on the same machine. It is claimed that holes can be tapped as closely as on a single spindle machine.

Indexing of the work-carrier, as well as lifting of the tapping head, is accomplished by cam action. Indexing is usually at the rate of 30 cycles per min.; by doubling or tripling the

number of spindles and the work, 60 or 90 pieces per min., can be finished.

All high-speed shafts are mounted on ball bearings. Coolant is pumped to the taps from a reservoir in the base. Floor space occupied is 33 x 50 in.; the height of the machine is 55 in.

Four different types of work-carrier or feed table, namely, dial, conveyor, push or drum feed, can be furnished, these tables being designed for the piece to be handled. A suitable hopper for feeding the pieces to the work-carrier can also be furnished. Attachments for light drilling and countersinking, for automatically feeding and inserting one or two screws in the piece after tapping, and for staking or spinning the screw after inserting are available. Also attachments for light forming, after tapping, for light milling or sawing, and for horizontal reaming of holes.

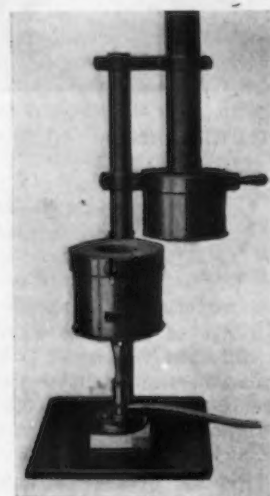
A new wall chart published by the Diamond Chain & Mfg. Co., Indianapolis, gives information necessary for selection of the proper chain for any application—size, pitch, weight, tensile strength, speed, rated horsepower and load in pounds of chain and corresponding information on sprockets to fit various sizes of chain. The new $2\frac{1}{2}$ -in. pitch Diamond chain, No. 480, is rated up to 408 hp. The chart measures 21 x 27 $\frac{1}{2}$ in.

Gas-Fired Laboratory Furnace

A NEW gas-fired laboratory furnace possessing some novel features has been placed on the market by Babcock & Wilcox Co., New York. It is fitted with an atmospheric burner which requires no auxiliary equipment and may be left to burn unattended with safety.

According to the makers, it will maintain a uniform temperature over long periods, and if fitted with the usual gas pressure regulator will maintain a temperature of plus or minus 10 deg. Fahr. for several days.

It can also be brought up to working temperature very quickly. Tests conducted by the industrial research division of Massachusetts Institute of Technology brought the furnace from room temperature to 2500 deg. Fahr. in about 30 min., and to 2000 deg. in approximately 15 min. The maximum temperature attainable with using ordinary manufactured illuminating gas under the usual 3-in. (water gage) pressure is somewhat over 2600 deg.



Laboratory Uses Include Calibrating Thermocouples, Melting Non-Ferrous Alloys for Test Specimens and Making Studies of Slags and Refractories

Fahr. The maker states that these unusual time-temperature operating characteristics are due to the use of proper gas velocities in the furnace, the stack proportions, a unique baffling arrangement, and the use of the new B. & W. No. 80 refractory insulator lining, which has an extremely low heat conductivity.

Either natural or manufactured gas may be used with the furnace, though the temperatures will be slightly lower with the former. The furnace is compact, which feature, combined with the insulating effect of the refractory lining, makes it relatively cool and very convenient to work around.

A device of this kind has many uses in the laboratory, such as calibrating thermocouples from the freezing points of metals, making melts of non-ferrous alloys for test specimens, and studies on slags and refractories.

Business Promises to Be Better but Not Good

Automobiles May Not Show More Than Seasonal Gains
Building Activity Must Improve from Present Low State
Railroads' Declining Traffic Does Not Spell Early Sustained Buying
Agricultural and Foreign Trade Outlooks Are Unfavorable
General Business, After Seasonal Gains for Month or So, Is in for a Dull Period

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE steel situation looks encouraging but does not seem to be up to optimistic current opinion. It is not unfavorable, but it is not favorable enough to warrant any great expansion. (And much the same may be said of business in general.)

In December, the trends both of the composite demand line and of steel production continued downward, both falling below their averages for the 1921-1927 period. The decline in the demand curve was due to reductions in freight traffic, building activity, automobile production, exports of steel, and farm purchasing power. The only factor that gained was mining activity, which was chiefly due to coal. The index was the lowest since September, 1924.

One's first impression, however, is that a remarkably close adjustment has been established between steel production and the indicated requirement. Steel making during November and December was reduced almost exactly in proportion to the current requirements of the chief consuming industries. But does the situation illustrated in the chart warrant belief that an immediate expansion in steel production is justified or that the currently reported sharp increase in use of capacity is desirable?

I think not. Current sentiment in the steel trade is probably another illustration of the present tendency toward a revulsion from the extreme pessimism of November. There is now some danger of arousing exaggerated hopes of a sustained early recovery. The composite demand line in December declined a little more than the adjusted index of steel production. The former fell from a point a little above the steel curve to a point a little below. Above all, it seems that insufficient correction of the sum-

mer production excesses of last year has as yet taken place.

It is clear that the automobile industry is showing some expansion. Probably construction contracts have increased in volume. But has the recovery been more than seasonal? And does it indicate the beginning of a sustained upward trend? We cannot know the answer to the first question before the middle of the current month, nor the answer to the latter question before the end of March, but we can draw some tentative conclusions as to probability.

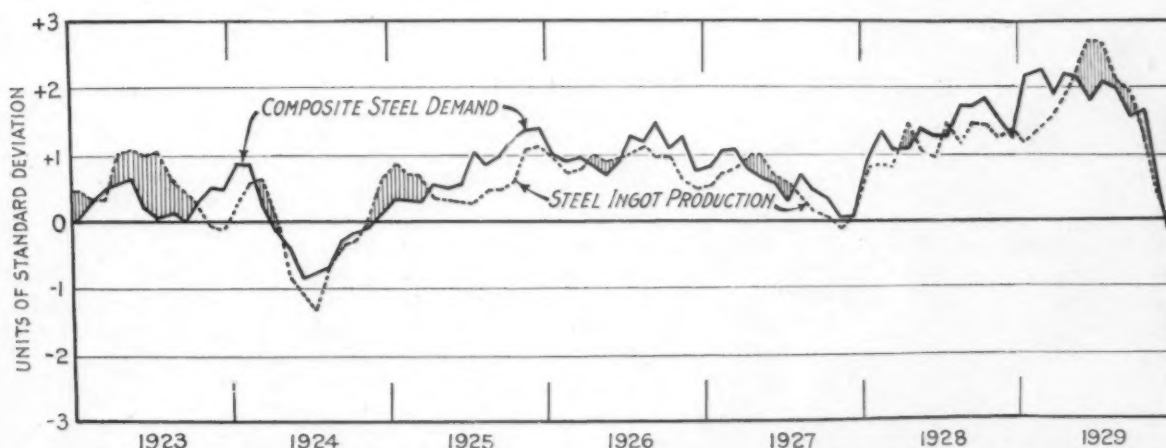
Automobile production in January usually averages about 10 per cent greater than in December, and seasonal gains continue through April. It would be surprising not to find an appreciable pick-up going on at the present time.

Building activity is so low that it must turn before many months pass, but there are no indications here that the bond market is in a position to encourage expansion in the near future, and there has been sufficient actual overbuilding in many centers to prevent a rapid upswing.

Railroad traffic and earnings continue in a declining trend, and do not support hopes for early sustained gains in steel buying on the part of the carriers.

The unfavorable outlook for agriculture and for foreign trade is significant.

A general analysis points to the conclusion that little, if any, more than seasonal gains are to be expected during the next month or two, and that several months of dullness and relatively low levels for business activity lie ahead. Business promises to be better but not good.



In 1924 and 1927 and Also in 1921 the Ingot Output Fell Below Indicated Requirements for Periods of 3 to 6 Months. In 1921 and 1924, moreover, steel production did not pick up until the demand curve had plainly ceased to decline

This Issue in Brief

Reaction from extreme pessimism of November may arouse exaggerated hopes of a sustained early business recovery, says Dr. Haney. Predicts that general business is in for several months of dullness.—Page 449.

* * *

Cuts foundry costs by rearranging equipment, without interrupting production. Less use of manual labor, increased production and lower costs result from having material move over active floor space without congestion.—Page 438.

* * *

Corrosion resistance and heat resistance are almost one and the same problem, says metallurgist. Comparison of the analyses of high-temperature alloys shows their striking similarity to many of the alloys used in field of corrosion resistance.—Page 431.

* * *

Speed in changing dies on large presses is gained by use of crane with movable cab. When crane is spotted over the press, the operator moves his cab along its runway so that he can look down at the die and control his operations without depending on signals.—Page 428.

* * *

When drawing high-chrome-nickel sheets for the manufacture of kitchen utensils five or six heat treatments are required, instead of three or four, as in the case of steel. And the heat-treatment temperature is higher, being 1900 to 1950 deg. Fahr., instead of 1300 to 1350 deg.—Page 445.

Strongest weld on all sizes of pipe commonly welded is the open, single-vee butt weld. Pipe should be supplied by manufacturer with ends machine-beveled.—Page 435.

* * *

Caste system may prove an obstacle to industrial growth of Japan. Work must be rated in value and attractiveness, and according to the amount of skill called for and training necessary, not according to the caste of the man, says engineer.—Page 443.

* * *

Cuts pig iron unloading costs by receiving iron in large quantities at less frequent intervals. Cars are unloaded by contract at a cost of about 30c. a ton, which is considerably less than it would be were a crew of laborers maintained for this work.—Page 440.

* * *

Inexperienced welders can make good pipe welds by using liners. The liner prevents protrusions on inside of pipe, and becomes fused to the bottom of the weld.—Page 436.

* * *

Varying results obtained in different plants from the use of the same carburizing compound are due to varying conditions, such as furnace design and kind of fuel used.—Page 432.

* * *

Two men do the work of 16 by equipping presses with automatic lubricating system. Valve on each bearing delivers a predetermined quantity of lubricant and shuts off automatically.—Page 428.

Punch breakage avoided by using revolving punch for making and countersinking very small nail holes in sheet steel. The tool is unfluted, and instead of being flat, it has a 5-deg. angle. It is spun into the piece and cuts out a slug the same as a punch.—Page 429.

* * *

Sharp increase in steel output would not be warranted by conditions in the consuming industries, economist indicates. Major consuming industries show little more than seasonal gains.—Page 449.

* * *

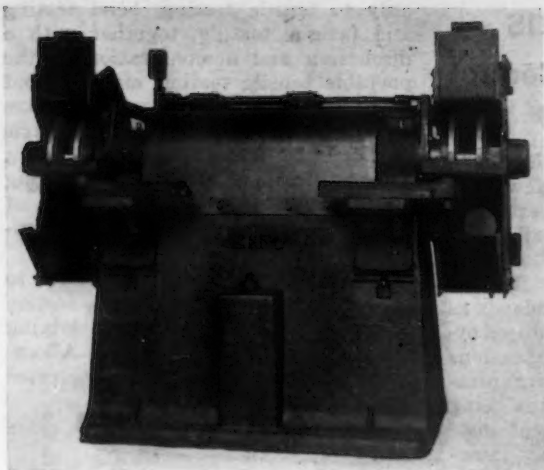
Do not send a "high-pressure" representative to Japan, for he would very likely do more harm than good. The ideal salesmen in the land of the Mikado is progressive without being ultra-progressive, healthy, flexible-minded, not too young. By all means analyze his job for him before he sails.—Page 443.

* * *

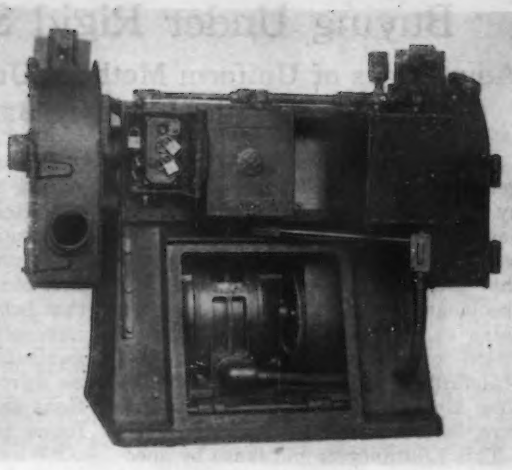
Failure of alloys at high temperatures is often due not to oxidation or lack of strength but to corrosion by chemicals and gases, which attack a particular element in the alloy.—Page 432.

* * *

"Excellent," says one manufacturer; "No good," says another, concerning the same alloy for case-hardening. The alloy is the same in both plants, but conditions differ. Varying methods of heating produce different results.—Page 432.



THE Three-Button Switch Shown in the View at Right Is Arranged with Padlocks to Prevent Use of Improper and Dangerous Wheel Speeds



Multi-Speed Grinder Arranged to Prevent Overspeeding

SAFETY devices intended to prevent overspeeding of the grinding wheels are features of the new MWR grinder recently added to the line of the Ransom Mfg. Co., Oshkosh, Wis.

The machine illustrated is equipped with 24 x 4-in. wheels and is driven through Texropes by a 7½-hp. multi-speed ball-bearing motor. Motor speeds are 900, 1200 and 1800 r.p.m., giving 1025, 1367 and 2050 r.p.m., respectively, to the arbor, the lowest speed being for 24-in. wheels and the highest speed for wheels worn to 12 in.

Start and stop push buttons are mounted above one of the inclosed starting panels. It may be seen from the rear view that there is also a three-button switch arranged with padlocks. This switch controls the wheel speeds, and only one of the speed change buttons is supposed to be unlocked at any time, the foreman or other person responsible for proper wheel speeds having charge of the key.

However, as pointed out by the makers, this arrangement does not

take care of the possibility of a workman replacing a small wheel with a larger one, and neglecting to have the speed reduced accordingly. Where a safeguard against this is wanted, the machine can be equipped at slight additional cost with a controller device which can be attached below the wheel and must be lowered before the wheel can be changed. The controller arm automatically operates a selective switch that gives the correct speed for the diameter of wheel.

A full line of the machines in sizes from 18 to 36 in., for both vitrified and high-speed wheels, is built.

Redesigns Plain Milling Machine

THE Brown & Sharpe Mfg. Co., Providence, R. I., has announced a redesigned model of its No. 13B plain milling machine.

Feed ranges and capacity are about the same as previously, the machine having a longitudinal feed of 34 in., transverse adjustment of spindle of 4 in. and vertical adjustment of spindle of 12 in. The top of the table is 32 in. above the floor, which, in addition to being the usual conveyor height, is calculated to reduce fatigue where work must be lifted from the floor. The driving pulley is located at right angles to the table to permit batteries of machines to be driven from one lineshaft, with a minimum of floor space.

Bed, table ways and column on the new model are cast in one piece with internal bracing webs. Table ways are 42 in. long. Spindle cross-adjustment of about 4 in. is obtained through a 7¼ in. diameter sliding sleeve, which carries the spindle and its bearings. The spindle head is massive, but can be adjusted without cramping or sagging. It is clamped in position by four bolts. Adjustment is by means of a long movable nut mounted on the stationary screw. Feed is by a revolving nut mounted on stationary screw. Overarms are of the double type.

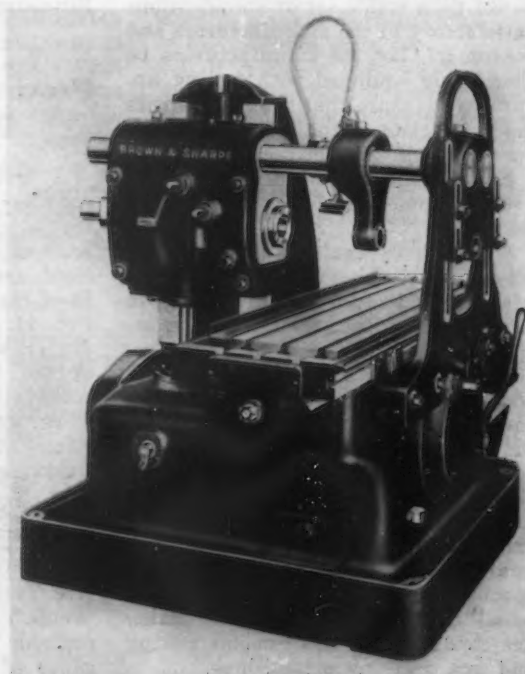
Self-adjusting multiple dry-disk

clutch is used. The drive is through splined shafts and gears and anti-friction bearings are extensively employed. Bearings are spaced closely and shafts are short.

Operation of the table may be en-

tirely automatic, if desired, and a variety of operating cycles can be obtained by means of adjustable dogs. One control lever of directional type actuates all power movements of the table; change from feed to power fast travel is obtained by moving the lever at right-angles to the table axis.

THE Low Table Permits Convenient Connection to Conveyors and Facilitates Placing Work from the Floor. One lever, of directional type, actuates all table movements



Buying Under Rigid Specifications

Advantages of Uniform Methods Under Adequate Control, Compared with Hesitancy Based on Suspicion

WASHINGTON, Feb. 3.—While it is generally recognized that purchasing by specifications effects many economies, a study of the purchasing methods of various agencies shows that a great majority who could use specifications to advantage are not doing so. A. S. McAllister, of the division of specifications, Bureau of Standards, told representatives of the New England Council, in conference here, last Thursday.

This hesitancy to purchase by specifications, he pointed out, is prompted by the fact that many purchasers not individually equipped to make their own acceptance tests have been reluctant to adopt the specification methods of buying, because of the fixed belief that manufacturers do not adhere to specifications.

In an effort to circumvent this objection, and thus increase purchases by specification, the Bureau of Standards has compiled and made available a complete list of commercial testing laboratories throughout the country, together with indications of the types of the commodities which they are prepared to test, according to Mr. McAllister.

In a great many cases where specifications are now being used, considerable economies to the nation as a whole would result from making certain changes in the prevailing methods of specifying, manufacturing, testing and accepting commodities. "To give emphasis to these changes," Mr. McAllister declared, "assume the existence at the present time of a limited few manufacturers of a certain group of commodities supplied to approximately 1000 consumers, each having his own specifications and making his own acceptance tests.

"As a substitute therefor let there be set up a single set of specifications satisfactory to the manufacturers and consumers. Let the manufacturers be thoroughly equipped with testing apparatus to insure that the commodities made by them actually comply with specifications, and let recognized testing establishments be utilized by the 1000 consumers to check the deliveries.

"Thus there would be abolished the hit-or-miss method of specifying, manufacturing, and method of testing, in favor of a logical arrangement in accordance with which a nationally recognized specification for a selected commodity is so formulated as to cover the most satisfactory commodity in the best possible manner. This commodity is placed in 'mass production' by the manufacturers in accordance with this specification. Certificates are issued by the suppliers, guaranteeing compliance with this specification and tests and inspections based on this identical specification are conducted by independent testing and guaranteeing establishments."

While these conditions are ideal and can be realized with only a few commodities at present, they nevertheless represent a proper goal for all interested organizations to strive to reach. Mr. McAllister pointed out. He said that between dimensional standards as advocated by progressive producer organizations and quality specifications as advocated by consumer organizations an effective compromise is being found in performance specifications.

"What the user is primarily interested in is service rather than the materials and dimensions necessary to render service," said Mr. McAllister, "whereas it is to the interest of the manufacturer to select such materials and give them such shape and size as to perform the required service at the minimum production cost."

A. M. Byers Co. Reorganizes Sales Department

The A. M. Byers Co., Pittsburgh, has reorganized its sales and distributing facilities throughout the entire country. Realignment of sales territories, involving the promotion of nine members of the Byers organization to division managerships, is a basic feature of the new program.

The nine division headquarters and their division managers are: Boston, A. A. Gatheman; New York, G. W. Hamill; Philadelphia, J. C. Chaffe; Atlanta, Ga., A. D. Sheere; Houston, Tex., H. B. Weathersby; Pittsburgh, G. E. Clifford; Chicago, M. G. Henderson; San Francisco, H. K. Brown; Tulsa, Okla., F. W. DeLuce. Railroad business remains under the direction of J. H. Ainsworth, director of railroad sales, with headquarters in Pittsburgh.

Proving the Worth of Welds Before Engineers

A critical discussion of tests for proving the worth of welds will feature a joint meeting of the New York sections of the American Welding Society and the American Society for Steel Treating on Tuesday evening, Feb. 11. The meeting, preceded by a dinner, will be held at the club rooms of the Building Trades Employers' Association, 2 Park Avenue, New York, and the speaker will be A. B. Kinzel of the Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

The paper, with J. B. Dawson of the same laboratory as co-author, is entitled "Destructive and Non-Destructive Tests for Proving the Worth of Welds." It discusses critically the methods of testing and the significance of the results. It refers not

only to tensile testing, bend testing and fatigue testing, together with a discussion and demonstration of the portable tensile testing machine, but also to non-destructive tests by means of the stethoscope, X-ray, electric conductivity, etc. There will be a demonstration of stethoscopic testing and a discussion of the application of the results of all these tests to engineering structures.

An invitation has been extended to the members of the New York section of the American Institute of Mining and Metallurgical Engineers. All engineers and metallurgists interested will be welcome.

Kinite Corporation Adds Toledo Plant

The Kinite Corporation, Milwaukee, maker of Kinite alloy steel castings, bar stock, and Ironite (a vanadium-nickel alloy) has increased its manufacturing facilities through the acquisition of the Toledo, Ohio, foundry of the Owens-Illinois Glass Co.

This foundry, in addition to providing quicker service to its Kinite and Ironite customers in Detroit, Toledo and surrounding territories, will also make gray iron castings and Ironite castings for the three Owens-Illinois glass plants in West Virginia for the present. The Milwaukee foundry will be operated as usual on both Kinite and Ironite.

United Steel Works Sales \$84,653,800 in Last Quarter

DÜSSELDORF, GERMANY, Jan. 13.—Steel ingot production of the Vereinigte Stahlwerke A. G., in the first quarter of the company's business year, beginning Oct. 1, 1929, was 1,705,526 metric tons, compared with 1,695,920 tons in the previous quarter. Pig iron output was 1,657,442 tons, compared with 1,680,436 tons in the previous quarter. The total of all sales in the quarter was 354,200,000 m. (\$84,653,800), of which 135,900,000 m. (\$32,480,000) represented exports. Unfilled tonnage at the end of the quarter (Dec. 31) was 70.5 per cent of the total at the end of 1928. In December, 1928, however, there was a heavy accumulation of unfilled orders as a result of the lockout in the Ruhr.

Elwood Plant Runs Full

All 20 mills of the tin plate works at Elwood, Ind., were placed in operation during the week of Jan. 27. They will run on a 12-turn or four-day a week schedule. Since Nov. 1, last year, only 13 mills have been operating on a 14-turn a week schedule. Other departments will increase operations accordingly.

Should Age Bar Employment?

Pros and Cons of Hiring Age Limit Presented at Meeting of American Management Association

HIRING age limits were a leading topic of discussion at a meeting of the American Management Association, held at Hotel Statler, Cleveland, Jan. 29 to 31. Undue attention has been given to the subject, in the opinion of one of the speakers, Murray W. Latimer, Industrial Relations Counselors, Inc., New York, because employment has declined in the face of prosperity. Employment of men over 45 is actually increasing in some industries and many companies have no age restrictions in hiring.

Older Employees Increasing in Steel Industry

As the result of a survey covering a number of large firms employing over three million workers, Industrial Relations Counselors found that in 42 per cent of the companies employing 26 per cent of the total number of persons covered there was no age limit for hiring, Mr. Latimer pointed out. In 40 per cent of the companies employing 61 per cent of the total, either all persons over a certain age were refused employment or else a high executive's consent was required. In 18 per cent of the companies employing 13 per cent of the men, there was no restriction on hiring, but pensions were not granted to persons hired over certain ages.

Not all industries impose hiring age limits to an equal degree. Of the 1,900,000 persons employed by companies who refused to engage persons over a certain age, almost 80 per cent were on railroads or in public utilities. Only one-sixth were in manufacturing companies. It was concluded that the possibility of a person over 45 obtaining employment with a railroad or public utility was small, but over two to one for obtaining a job in manufacturing.

Despite the existence of hiring age limits, many exceptions to the rules were discovered, so that it was necessary to make a direct examination of the age distribution of the gainfully occupied. Examination of the age data in the United States Census of Occupations supplemented by a special investigation made by Industrial Relations Counselors, in 1929, indicated that for the gainful occupations outside of agriculture employment of men above 45 has been increasing for at least 40 years. In certain industries, the change has been unusually rapid. For example, in the steel industry the proportion of persons 45 to 54 has increased 61 per cent in the last 20 years; from 55 to 64, 142 per cent; and 65 and over, 143 per cent.

The unusual amount of publicity

given to hiring age limits in recent years, according to Mr. Latimer, is due mainly to the decline of employment in manufacturing and railroad industries. Periods of general unemployment have probably always affected older persons more severely than younger. The peculiarity in the situation now is caused by the fact that employment has declined despite prosperity.

It was pointed out in conclusion that industrial companies themselves have supplied the only agencies which are attempting in any way to solve the problem of permanent and total occupational disability through their pension plans and the training and placement activities of their personnel departments.

Shorter Life Price of Prosperity?

"Forty explains a man's calendar age but not the man nor why he is what he is," said Dr. Eugene Lyman Fisk, medical director of the Life Extension Institute.

"Why is a man over 40? It is no answer to say 'because he was born more than 40 years ago.'"

"We are confronted by two problems: first, the premature breakdown and death of the human body which is characteristic of all civilized peoples; second, the failure in this country to show the improvement in this situation that is evident in other civilized countries. Those who believe that the life cycle of man is fixed by nature or by any other power must explain these inconsistencies.

"If it is fixed, why is it shrinking in this country? If it is fixed, why is it extending in other countries. What is there in American civilization that is sapping the vitality of those in later life? We can think of nothing except the great outstanding factor of stupendous industrial expansion and development. Is this shortened life cycle the price we must pay for our prosperity?"

Stagnation, Not Age, Is Danger

"The obsolescence of workers in middle age is not primarily a result of psychological deficiencies resulting from growing older," according to Elliott Dunlap Smith, professor of industrial engineering, Yale University.

Instead, their obsolescence results largely from the failure of industry to apply management scientifically. It occurs most often when periods of managerial and engineering stagnation are followed by spurts of intensive progress.

Such evidence as there is indicates that the body feels the weight of

years before the mind, and that such changes in mental capacity as do occur before ripe old age are more a result of experience and environment than of the mere passage of years. Even learning power remains undimmed throughout middle age provided it has been continually exercised.

Where there has been continuity of job requirements, the formation and improvement of habits of skill of mind or even of hand usually more than compensate for any loss in inherent nimbleness. Thus, in those trades and professions where the fundamental requirements have remained stable, workers command their highest wages after middle age. This is true of machinists and carpenters, as well as of executives and engineers. It is true to a large degree even when, because of simplicity of the job, the value of accumulated trade knowledge is less.

Even where there have been fundamental developments of job and job requirements, if there has been continuity of development, middle age workers have been able to adapt themselves to the change.

In selling and in managing, for example, although there has been exceptional job development in the past two decades, in those concerns where this development has been continuous and the salesman or manager continuously exposed to it, middle aged people still hold the principal positions. Similarly, in factories which have made markedly continuous development in manual methods, middle aged employees hold their own.

It is generally only when the development of methods is sporadic and involves the abrupt changes on the part of the workers, that technical advance tends to bring about obsolescence of the middle aged worker. Such abrupt changes usually occur after a period of stagnation.

Age as an Executive's Asset

"Age in years as such not only is not actually a deterrent to the employment of executives but, in numerous cases, furnishes a positive argument in favor of their employment."

These conclusions were stated in a paper on "How Are Age and Technical Changes Affecting Employment of Executives?" by J. P. Jordan of the firm of Stevenson, Harrison & Jordan, management engineers, New York.

He fixed much of the blame for the difficulty of unemployed executives failing to secure employment on the men themselves. He said:

"Any man who has lived carefully, avoided overindulgence of every kind, kept physically and mentally fit, kept up to date in the matter of technical changes, and who has not allowed the zest of accomplishment to fade from his everyday life can unquestionably obtain employment at almost any age—certainly up to 60.

"These opinions are the result of 26 years of professional contact with concerns of all sizes, executives of all classes numbering into the thousands, and, during the last 10 years, a most intimate contact with hundreds of high executives of middle and late age.

"What is most often called 'too old' is a state of either mental or physical petrification or atrophy brought about by the individual himself, which condition begins to become fixed and noticeable at around the age of 40.

Lost Opportunities

"Not everyone can be the big chief," declared Mr. Jordan. "But a good executive is a good executive at any time, whether he can play golf or not, or whether he is 40 or 60. In fact, a man or woman who has kept physically and mentally fit, who has kept an open mind, who is alert at all times, who causes research of all problems, who studies and masters the science of human leadership and who plays the game hard at all times is never out of a job in the first place, but if he or she ever were out of a job, it would be for but a short time.

"If many who find difficulty in securing employment after the age of 40 or even 50 would seriously examine into their own lives they would, if honest, remember when and how they buried the talents given them years before.

"These talents are buried in such things as the golf courses, the long automobile tours where between trips all off time is spent planning trips instead of studying how to do a bigger job, the radio or the theater every night, the gratification of a wife's social ambition or selfish calls for amusement, the books of fiction, the cocktail parties or night clubs, and everything else that diverts the mind from eating, sleeping, drinking and loving one's work and career.

"True enough, there may have developed a sub-conscious and almost automatic conclusion on the part of employers that men from 40 on are undesirable. This is unfortunate and unfair. It also is bad business on the part of employers, as in varying degrees of development many men over 40 or even 50 are far more valuable for immediate necessities than younger men. Ripeness of experience injected into certain situations is often worth infinitely more than prospective future length of service."

Defends Age Limit

"In spite of caustic criticism we must recognize that there is a favorable side to the publication and enforcement of hiring age limits," said E. Grosvenor Plowman, industrial re-

lations advisor, Associated Industries of Massachusetts.

Unless we are to throw overboard entirely the theory that jobs ought to be given to those best fitted, we must agree that a reasonable hiring age limit merely crystallizes the fact of discrimination on efficiency and safety grounds which has always existed against the older person. From a purely social standpoint, society would be worse off if industry gave its jobs to the less efficient and more expensive of the two applicants.

Publication of hiring age limits for any artificial reason, such as the mistaken belief that pension costs may thereby be reduced, may have an adverse effect on the labor market from the job-seekers' standpoint which can not be too strongly condemned, he declared.

Unless old age is to mean universal retirement on savings or pension

benefits, we must recognize that older workers can be kept in employment until very much more nearly the end of their lives if the salvage point of view dominates our labor policy. This means that workers as they grow older must be adjusted medically and socially to their work and to their decreasing ease of performance.

The publication of a hiring age limit is an aid in the administration of labor policy along these lines. It reduces the competition of older workers for the few positions which can be held by the less efficient in the particular organization. It increases the likelihood that the worker will remain at his familiar occupation, since he will realize the valuable protection afforded him in his own company and the barrier to reemployment in this or other companies if he should attempt to change his job, Mr. Plowman said.

To Start Michigan Sheet Mill

New Plant of Newton Steel Co. Designed for Serving Automotive Industry with Wide Sheets

IT is planned to start operation on Feb. 17 of the first unit of the Newton Steel Co.'s new plant at Monroe, Mich. This plant, which has been under construction since early last year, is at the junction of River Raisin with Lake Erie. Such a location affords great opportunities for water transportation.

This first unit is a sheet mill designed for producing automobile sheets from 18 in. to 76 in. wide. The plant has been built with the general idea of the greatest possible service to the automotive industry, and in the plan has been incorporated a flexibility of mills that will permit getting out orders at short notice. For the present the company will start with sheet bars and roll them into finished sheets. Ample storage has been provided for sheet bars and a large inventory will be carried.

Everything about the mill is modern. Heating and annealing furnaces will be fired by producer gas, coming from a battery of complete units of gas producers. All furnaces are equipped with the latest devices in temperature control and are entirely automatic. The mill has been laid out for specializing in full-finished sheets and ample pickling equipment has been provided.

Straight-Line Movement in Process

In keeping with modern practice, the mill has been designed so that all materials shall move toward the final finish in a continuous stream. This insures a uniform product, which is tested physically and chemically after each operation. A modern laboratory is being built and equipped to take care of this work. Plant facilities, with full cooperation by transportation companies, will warrant overnight deliveries to all consuming

points and in some cases will be comparable to warehouse deliveries.

Mill machinery has been built largely by the Hyde Park Foundry & Machine Co., United Engineering & Foundry Co., Mesta Machine Co., Lewis Foundry & Machine Co., Wellman-Seaver-Morgan Co., McKay Machine Co. and Streine Tool Co. Electrical equipment was furnished by the General Electric Co.; cranes were furnished by the Alliance Machine Co.; furnace construction by Duraloy Co., Costello Engineering Co., Flynn & Dreffin Co. and George J. Hagan Co. In addition, several furnaces have been built according to Newton company's own design.

Before construction was started the mill site was carefully checked for level, and the equipment was placed amply high to insure operations at all times against high water. This has required much filling, largely with sand pumped from the lake.

Semi-Continuous Rolling Method

The new method of strip rolling of sheets has not been included in the construction of the present plant, because it is not flexible enough to take care of all gages and sizes manufactured by the company. A semi-continuous process has been substituted, which is the outgrowth of experiments carried on in the Newton Falls, Ohio, plant over the past three years. This plan cuts in half the labor required as compared with the old method of sheet manufacture, but allows flexibility and gives sufficient opportunity for testing between operations so that the uniformity of the product can be controlled.

Operating personnel trained in the Newton Falls plant is being moved into Monroe at present, to become familiar with the equipment.

Machinery Federation Proposed

Representatives of Various Groups Take Steps to Determine Feasibility of Forming All-Inclusive Association

A MOVEMENT toward the formation of a national federation of machinery industries was started in Washington on Monday at the fifth conference of representatives of machinery and equipment associations. A committee of seven, headed by Carl A. Johnson, president of the Gisholt Machine Co., Madison, Wis., who is also president of the National Machine Tool Builders' Association, will be selected by E. F. DuBrul, chairman of the conference, to take the preliminary steps. Two of those who will assist Mr. Johnson are D. Norris Benedict, of the Frick Co., Waynesboro, Pa., representing the Refrigerating Machinery Association, and Verne E. Minich, of the American Foundry Equipment Co., New York, representing the Foundry Equipment Manufacturers' Association. Others are to be named later.

The need for a federation of machinery industries has been impressed upon the representatives of the existing associations, particularly since President Hoover's business survey conferences, when it was found that no centralized group could speak for all of the machinery industries, numbering about 10,000 units, of which not more than 1000 are aligned with trade associations.

Nineteen Associations Represented

Monday's conference was attended by representatives of 19 trade associations. It was held at the building of the Chamber of Commerce of the United States in Washington.

The attendance list follows:

American Society of Mechanical Engineers, C. B. LePage, 29 West Thirty-ninth Street, New York.

American Road Builders' Association, William Ogden, manager Manufacturers Division, National Press Building, Washington.

Associated General Contractors of America, H. E. Foreman, 222 Munsey Building, Washington.

Associated Machine Tool Dealers, E. P. Essley, E. L. Essley Machinery Co., 551 Washington Boulevard, Chicago; J. R. McDonald, E. L. Essley Machinery Co., Milwaukee, Wis.

Association of Manufacturers of Wood Working Machinery, Fred A. Collinge, 111 West Washington Street, Chicago, Ill.

Bakery Equipment Manufacturers' Association, Paul Esselborn, Century Machine Co., Cincinnati.

Compressed Air Society, C. H. Rohrbach, 90 West Street, New York.

Dairy and Ice Cream Machinery and Supplies Association, Inc., Roberts Everett, 225 West Thirty-fourth Street, New York.

Diesel Engine Manufacturers' Association, M. J. Reed, 30 Church Street, New York.

Flour and Cereal Mill Machinery Association, C. Roy Dimm, Robinson Mfg. Co., Muncy, Pa.; H. A. Wolf, Wolf Co., Chambersburg, Pa.

Hydraulic Machinery Manufacturers' Association and Machinery Builders' Society, E. A. Stillman, Watson-Stillman Co., 75 West Street, New York (Also represents Machinery Builders' Society).

Knitting Machine Manufacturers' Association, Walter L. Toy, Scott & Williams, Inc., 366 Broadway, New York; F. Ahlfeld, Textile Machine Works, Inc., Reading, Pa.; H. S. Horrocks, H. Brinton Co., Philadelphia.

Laundry and Dry Cleaners Machinery Manufacturers' Association, Richard M. McClure, 111 West Washington Street, Chicago.

Mixer Manufacturers' Bureau, C. S. Embrey, Munsey Building, Washington.

National Machine Tool Builders' Association, Ernest F. DuBrul, General Manager, 617 Vine Street, Cincinnati; Carl A. Johnson, Gisholt Machine Co., Madison, Wis., president; H. E. D. Gray, Landis Tool Co., Waynesboro, Pa.

Pressed Metal Institute, Malcolm Baird, secretary-treasurer, 232 Delaware Avenue, Buffalo, N. Y.

Refrigerating Machinery Association, Fred Nolde, secretary, 23 South Fifty-second Street, Philadelphia; D. Norris Benedict, Frick Co., Waynesboro, Pa.; Emil Vilter, Vilter Mfg. Co., Milwaukee, Wis.

Shovel and Crane Manufacturers' Association, A. M. Ferry, Ferry & Dawson, 1104 Chandler Building, Washington.

Hugh P. Baker, manager, Trade Association Department, Chamber of Commerce of the United States, Washington.

Philip P. Gott, assistant manager, Trade Association Department, Chamber of Commerce of the United States, Washington.

William W. Dodge, *American Machinist*, New York.

R. L. Lockwood, Division of Simplified Practice, Department of Commerce, Washington.

E. W. McCullough, manager, Department of Manufacture, Chamber of Commerce of the United States, Washington.

Erik Oberg, *Machinery*, New York.

W. H. Rastall, chief, Industrial Machinery Division, Department of Commerce, Washington.

C. Southworth, Domestic Commerce Division, Department of Commerce, Washington.

C. E. Wright, *THE IRON AGE*, New York.

Views on the Business Outlook

Brief statements on business conditions and prospects in the respective lines were given by representatives of the various groups as follows:

Pressed Metal—Expect normal business by April.

Refrigerating Machinery — Prospects for 1930 fair.

Flour and Cereal Mill Machinery—Business, since the Wall Street slump,

seems to be improving. Normal business expected by March.

Road Building Machinery—Business very satisfactory. Road building not affected particularly by bad conditions.

Shovels and Cranes—Likely to be slow during first quarter, but optimism is running high.

Knitting Machinery—Some plants very busy. Others look for improvement during coming months.

Woodworking Machinery—January inquiries best since September. Business off 25 per cent from a year ago, but manufacturers look for fair year.

Compressed Air Equipment—December orders showed gain over those of November and also over December, 1928.

Machine Tools—Expect better year than any in past excepting possibly 1928 and 1929.

Panicky Feeling Overcome

Dr. Hugh P. Baker, manager of the trade association department of the Chamber of Commerce of the United States, in welcoming the machinery men, said that President Hoover's business conferences had overcome the panicky feeling which followed the stock market collapse and have spread the expectation that business will go along on a reasonably even keel.

He said that one direct result of the business conferences will be an inflow of accurate information on business trends. The development of complete and accurate facts on every phase of its industry, he said, is the greatest work of any trade association. If there is no other result than the stimulation of such fact-finding activities, the business survey conferences will have been worth while, he added.

Doctor Baker said that Julius Barnes, as chairman of the business survey conference, had just sent letters to 17,000 business executives, asking them to aid business by proceeding at once with plant repairs and betterments, so that some industrial stimulation will be afforded while larger projects are getting under way. Doctor Baker thought that an uptrend is now discernible in many industries, which will carry into the spring, but whether a secondary slump will develop could not, he thought, be foretold now.

Trade-in Problem Discussed

The conference discussed several other subjects including the trade-in problem, time sales, uniform cost accounting, statistics of industry, estab-

(Concluded on page 474)

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Spending and Saving

VARIOUS preachments of the new era exponents, who did the cheer leading in the late boom in securities prices, have been under revision in the past three months. Not so much has been said, however, of the exaggerated emphasis put during the boom months on the spending of the worker's pay. According to the new era economics the wage-earner's function is to spend his wage. Commonly there was the inference that the high rate of wages mattered little so long as the wage was applied to the maintenance of mass production on an ever increasing scale.

Certain British commissioners who were sent to find out why the United States so continuously enjoyed good times were told in some quarters that much of our prosperity was due to the high wages paid here and to the large percentage of the wage total that regularly made the circuit from manufacturer, by way of the pay envelope, on through the various channels of consumption of goods back to the producer's treasury. While this explanation had in it a strong suggestion of lifting one's self by one's bootstraps, it was put forward with a marshaling of consumption statistics that gave it much weight.

At the same time there came along a propaganda against thrift. One economist, so-called, pointed out that thrift was no longer the virtue it had commonly been thought. Just as the Menckens were glorifying self-expression as the newly discovered way to character building, the apostles of the new economics were telling the wage-earner that to come into his best estate he must widen his horizon by freely spending his wage. Thrift may have been well enough in Poor Richard's day, but in the bright lexicon of the new era it was listed only to show that it had become obsolete. Henry Ford, with his familiar fondness for being different, averred that "much of the advice given to young men about saving money is wrong," adding: "I never saved a cent until I was 40 years old."

It may be true that the American wage and the American standard of living call for at least one motor car in every family. We would by no means limit the satisfactions to which American workers may aspire. These should steadily increase, as they have long been increasing. But in the present interval between the country's most demoralizing boom and the period of sounder prosperity which we believe is just ahead, it is in order to question whether in recent years, and particularly in 1929, there has not been a good deal of overspending for consumption goods, a good deal of buying of things which the buyer could not afford. While in the management of corporations saving has been stressed as never before, and additions to surplus

have been pointed to as proofs of prosperity and wise administration, the new era teaching has put the financing of the individual consumer in an entirely different category.

The wide acceptance of the new doctrine of free spending naturally went with the belief that each succeeding year would see production and consumption at a new height, the consumer's buying power growing meanwhile by what it fed on. But now that the pace has slackened, more heed will be given to the relation between individual saving and increase of the national wealth in fixed capital. Public works now scheduled by State and Federal Governments and the new construction planned for 1930 by public utility, industrial and building corporations call for far more capital than has been so applied in any recent year. It remains to be seen to what extent, as the result of lessons lately learned, individual savings will supply this need and at what lowering of the 1929 outlay for certain forms of consumption goods.

A Campaign to Speed Up Building

"BUILD Now!" might appropriately be the slogan of the campaign of publicity and education that has grown out of the efforts of President Hoover's national business survey conference. The injunction will be carried by radio, by talking pictures, by printers' ink and by other means to every nook and corner of the country, that an early beginning of construction activities will do much to restore a normal volume of general business and sustain employment.

Anticipating that a strong upward movement in building construction may be expected by mid-year, the committees in charge of the building phase of the business stabilization campaign will urge that, so far as possible, contracts be let for contemplated building work before May 1.

While there is no desire, as we understand it, on the part of the sponsors of the "Build Now" movement to stimulate unnecessary construction work, an effort is to be made to flatten out the peak which might normally come later in the year and provide industry with orders for materials and labor at the present time.

Building statistics of the past few years indicate that residential construction is the most likely to respond to stimulation, seeing that the building of dwellings has lagged far behind other classes. Cooperation of banks, mortgage companies and building and loan associations will be invited, to the end that financing of home projects may be handled expedi-

tiously. Warnings will be sounded against the danger of unjustifiable delays, which might mean eventual labor stringency and higher commodity prices.

A particular effort will be made also to induce corporations which contemplate new factories, additions or other physical expansions to lose no time in getting these projects started. Commercial and industrial buildings approximate in money value 30 per cent of all building work in normal years. A factor which is thought to be favorable in this group is that financing may be largely independent of the mortgage market, as the treasuries of many industrial and commercial businesses can be drawn upon for necessary expansion.

It is obvious that now is a propitious time for the metal-working industries to rehabilitate plant equipment and displace obsolete machines with those of modern design. Slack periods are utilized in this way by comparatively few companies. Most seem to wait until they are forced to act, either to cut production costs or to increase output.

For those who contemplate building in which steel is an important element of cost, there appear these favorable factors: Steel selling prices, on the average, have dropped to the lowest levels since 1927 and deliveries of steel may be obtained to fit in with almost any plan.

An enlightened self-interest on the part of manufacturers in metal-working lines, most of whom derive direct or indirect benefits from a high volume of activity in building construction, dictates that they lend their support to a rational building program, not only by the early placing of contracts for projected new work in their own plants, but by the use of their influence as business leaders in their own localities to further residential construction and civic improvements.

The Doctor Points the Way

A MEDICAL department is now such a common adjunct to a large business organization that its absence would cause more comment than the sight of an industrial "hospital" equipped with the latest apparatus for electrotherapeutics and sun-ray treatments. In a manufacturing plant the duties of the medical staff have long since outgrown the first-aid treatments after serious accidents, which were its sole duty 20 years ago. Safety committees, by continuous efforts, have cut down the necessity for first-aid, by reducing the number of accidents, so that the medical department's principal duty now is corrective hygiene. Experience in many places confirms the view that, if all workmen are encouraged to come to the hospital for advice on any ailment, however slight, as soon as it appears, the amount of lost time and absenteeism is reduced correspondingly.

The plant physician, as soon as this point is reached, can systematize his records, and the manager is then able to give personal attention to the circumstances which cause an undue percentage of complaints. As an actual instance, in one of the large tool plants, the doctor found that he had to be constantly on guard against small infections on the hands and arms of the machinists. Many good workmen seem to be very susceptible to irritation by oils, gasoline or

cutting fluids, even though the skin is free from scratches.

Since all the cutting fluid at this plant was being circulated from a central reservoir (as a matter of economy) it was an easy matter to clean up the sump, filter all incoming fluid, and install a pasteurizing tank where the outgoing liquid is kept at 140 deg. Fahr. for 20 min. After these changes were made, the better hygienic conditions in all the machine shops were immediately reflected in the medical department records.

But conditions were still bad in the receiving and cleaning department. A major fraction of the incoming bar stock consisted of cold-drawn screw stock, ground shafting and other steel with high finish, all of it protected from corrosion by heavy slushing oil. This was not only messy in its right place, but contributed much to grimy surroundings in the warehouse. Furthermore, the oil had to be cleaned off before the steel could be forwarded to the machine shops, and the cleaning tanks seemed to be the source of the same skin troubles as were formerly epidemic in the shop.

In revolving this matter in his mind the plant physician asked the question, "Could not these special finish steels be lacquered at the shipping point?" It seemed a good suggestion, at least worth investigation. It was duly found that a piece of lacquered steel could be fed into a screw machine at standard speed; the paint did not gum up the cutting tools or interfere with operations to any measurable extent.

Furthermore, the warehousemen liked the idea; lacquer dispensed with the cleaning operation; it eliminated greasy storage racks, and each style of finish or class of alloy could be given a distinctive color—no chance to mix up the stock. The steel mills had to be argued with a little bit, but a trial convinced them that the lacquering could be done on a table, continuously and almost instantly, as the warm bars were fed past a converging spray from three or four guns. Here again the cost was as low as or lower than the older method of slushing with grease.

It's another instance of the principle that the best is always cheapest. Only in this case it took the doctor to point the way.

Steel Deserves a Fair Profit

AT the American Iron and Steel Institute meeting of Oct. 28, 1927, Mr. Schwab, taking up the duties of president of the institute, made the impressive statement "on the average we are not earning as much on our investment as we would if we had put our money in gilt-edged bonds." Incidentally bonds are yielding a larger return now than then, but we need not press that particular point.

When the steel companies are reporting such large earnings for 1929, it is important to observe and measure the great difference between conditions during most of that year and conditions both in the fourth quarter of 1927 and now. As measured by THE IRON AGE composite, finished steel prices now average slightly below the average during the fourth quarter of 1927 and are a negligible amount above the low point of that quarter. Steel production is some 20 per cent above the rate in that quarter, but the in-

crease in capacity meanwhile has been nearly if not quite 10 per cent.

Present conditions as to tonnage and prices are not greatly different from those in the fourth quarter of 1927, of which there was rightly so much complaint. Conditions ruling during nearly all of last year were very different and the large earnings now being reported are water that has passed the dam. The investment of the steel industry has been very substantially increased, and it takes a larger total of earnings to make even the same return as was complained of two years or more ago.

In the last few years the steel industry has been investing money in three ways: First, chiefly by independents, to increase productive capacity; on such investment the investor must of course take his chances. Second, to economize in cost of production; in some cases the outlays have been heavy relative to the computed saving, while there is the important point in addition that, if all producers make such improvements and then hand all the savings to buyers, they are simply so much the worse off, their improvements earning nothing. Third, to improve quality; for such improvement in quality the seller is entitled to charge.

In many cases the commensurate return is not secured. There are many finished steel products which, on the quality standards of five or even three years ago, would now be entitled to a substantial premium over basis prices, but are bringing no extra. The quality of three or five years ago has simply become unmarketable.

As much as it did in the closing months of 1927, or even more, the steel industry now needs cooperation and fair marketing methods. Destructive competition is out of the question. Buyers prefer steady prices and once prices are down they are reluctant to pay advances. There have been, and will be in the future, short spells of productive capacity exceeding steel demand by one-third or more. Such spells need to be tided over. Quality should be paid for, which is fair alike to the consumer and to the producer, who has made large investments to furnish it.

Variations in Automobile Production

WHEN in the course of a year an industry has an unusually heavy production one would naturally expect the result to be attained by there being well sustained production during the year. That is exactly what did not occur last year in automobile production. There was an exceptional gain over the previous record year's total, but the biggest month was particularly big and the smallest month was particularly small. Some light on the trade prospects should be thrown by a careful study of what occurred last year.

Canadian production for December has been reported, making the official total of cars and trucks produced in the United States and Canada 5,621,656, an increase of 1,020,515, or 22 per cent, over 1928. Noting that 1923 and 1928 were record years in their respective times, and there was only 10 per cent increase in the five years, the 22 per cent increase in one year was rather spectacular.

There is a strong seasonal factor in automobile

production, for which allowance must be made in studying the variations in production last year. No year can be expected to be strictly "normal" or even average, but a five-year average must have a large element of truth in it. In the accompanying table the first column shows relative production by months computed from the average of the five years 1924-1928, inclusive. The second column gives the corresponding relatives for 1929 production and the third column shows the divergence.

	Relatives, 1924-1928	Relatives, 1929	Divergence of 1929
January	80.6	90.2	+ 9.6
February	99.2	106.2	+ 7.0
March	120.6	133.7	+13.1
April	124.9	141.7	+16.8
May	121.6	135.8	+14.2
June	106.7	121.1	+14.4
July	101.5	110.6	+ 9.1
August	104.5	109.5	+ 5.0
September	101.6	91.7	- 9.9
October	100.8	84.2	-16.6
November	74.9	48.5	-26.4
December	63.1	26.8	-36.3
Total	1,200.0	1,200.0	0.0

The five-year average indicates definitely what was the average distribution by months of a year's production, April being the highest month and December the lowest month, March to October running above the average pace and the other four months below it. We use the past tense, because the period included a great replacement of open by closed cars, stimulating sales in the latter part of the year.

Last year, with its large gain in total, ran far above the usual seasonal distribution in the very months that had previously run high, and was far below in the late months. December had been one-half the highest month; last year it was not one-fifth. All of which goes to emphasize the abnormal character of last year's output, with its accumulation of uncomfortably large stocks of new and used cars, against a much more than usually sharp curtailment at the end.

It has been concluded from oscillograph studies of the welding current that the transfer of metal from a welding electrode to the joint occurs periodically in "waterspout" fashion. When a drop passes over it produces a short circuit, the current strength rises to the peak value limited by the reactance of the generator, and the voltage drops to zero until the passage of the drop is completed and a new arc is formed. This actual process of metal transfer has been photographed by A. Hilpert at the Technische Hochschule, Charlottenburg, Germany, and reported in the *Journal of the American Welding Society* for December, 1929. Two thousand exposures were made per second, the welding arc being placed between the camera and such a strong light that the metal appeared in silhouette on the film. Two principal types of metal transfer were observed: (a) the thread-shaped drop where molten metal drains down a "waterspout," which rapidly thins and breaks in two, and (b) the mushroom-shaped drop, where the molten end of the electrode enlarges and in dancing about meets a geyser of metal drawn up from the plate underneath. Duration of these contacts lasted a time which varied from 0.15 to 0.0005 sec.

Local Chapters for Gray Iron Institute

In carrying out its policy of assisting members in different territories to form local chapters through which work of the organization can be applied to individual problems in the various districts, the Gray Iron Institute, Cleveland, announces the first of a series of meetings to be held in the Eastern section of the country. The locations and dates are:

Buffalo, Feb. 11, Hotel Statler; Syracuse, N. Y., Feb. 13, Hotel Syracuse; Harrisburg, Pa., Feb. 15, Hotel Penn-Harris; Philadelphia, Feb. 18 (tentative) Manufacturers' Club; Baltimore, Feb. 21, Lord Baltimore Hotel.

Each meeting will start with luncheon at noon, followed by a presentation of the various institute activities. Every gray iron foundry executive is invited to attend the meeting closest to his city. Four of a series of eight meetings have been held in the Western territory, and Arthur J. Tuscany, manager of the institute, says that these sectional meetings are being favorably received in every section, and that the meetings thus far held have more than justified expectations.

Railroad Spring Plants to Be Consolidated

The Fort Pitt Spring Co. and the Duer Spring & Mfg. Co., both of McKees Rocks, Pa., manufacturers of railroad and industrial steel springs, are to be consolidated with the spring department of the Standard Steel Car Co., Butler, Pa. Although details of the merger have not been announced, it is expected that the plants will be operated separately, with present personnel unchanged. Offices of the combined companies will be in Pittsburgh, and further acquisitions are planned after details of the present merger are worked out.

Dismissal Wage Paid When Plant Is Closed

"The United States Rubber Co. is now paying a dismissal wage when, due to reorganization, a factory is permanently closed or a process definitely discontinued," declared Miss E. H. Little, assistant supervisor of industrial relations, before the personnel conference of the American Management Association at Cleveland, Jan. 31.

"The dismissal wage is paid on the basis of one week's pay for each year of employment to persons with 15 years of service and to those 45 years of age with 10 years of service. In closing four factories, 502 persons have benefited, in amounts varying from \$125 to \$2,000.

"Under modern methods of conducting industrial enterprises, running a factory is no simple endeavor, but to shut it down permanently, in a well-

ordered and efficient manner, is a far more difficult task. Its closing means the breaking of old associations, the scattering of families and very generally results in radical readjustments for everyone intimately concerned. The word most frequently used by our old employees as they come around to see us is 'shock.'

"Two parts of the policy which we have adopted in closing factories have

proved their value as shock absorbers. One is the month's notice and the other is the dismissal wage. The beneficiaries of the latter are largely this middle-aged group. The month's notice provides for mental readjustment and the dismissal wage, in some measure, for economic readjustment, and the mental readjustment is an important factor in making the economic readjustment."

The Week in Business

Drift of Current Financial and Economic Opinion

THAT the banking situation is favorable to the immediate resumption of fairly full business activity is the contention of many of the week's comments. The fact is important in view of the momentum that seems to be gathering to expedite building construction, especially in the field of new dwellings and the modernization of old ones.

The Harvard Economic Society called attention to the complete wiping out in two months of the extra growth of commercial loans between May and November last year, admitting at the same time that the liquidation of collateral loans has been less thorough, particularly for banks outside of New York. It goes on to say that the "prospect is that during the next few months money conditions will continue favorable to business."

The National City Bank of New York holds that "the theory that numerous banks are loaded up with frozen collateral loans is simply a surmise prompted by the rapid decline of stocks." Such loans, it adds, "certainly are no bar to credit expansion in any volume that business may require."

The executive committee of the National Business Survey Conference has approved the promotion of "prudent private and public construction," and of action by retail and wholesale trade associations to promote normal placing of advance orders. The F. W. Dodge Corporation places the expenditure for residential building in 1930 at 392 millions of dollars ahead of 1929 and in all kinds of buildings at 837 millions more than last year.

As contrasted with the favor shown toward the active response of the railroads to the Hoover conferences for business stabilization

and the determined efforts of building interests to hasten construction programs, are opinions that promises in other directions show too few evidences of fulfillment.

The sharp shrinkage in car loadings is offered in proof, those of later January being near the low point of December. The *Financial Chronicle* gives the palm to the railroads for making "little or no attempt to cut down their expenses, being desirous of maintaining employment as nearly as possible on the old basis."

To what extent the current improvement in business is indicative of a real upturn in the trend it is still too early to say with certainty, according to the National City Bank. February dullness is looked for by William C. Cornwell, of the *Bache Review*.

There is a general recognition that agriculture received a sharp blow in the declines in wheat and cotton, but, says the *Financial Chronicle*, "if the activity in the steel industry is maintained and the recovery in the automobile trade likewise continues, and the scale of operations is widened and enlarged, the forward movement will sooner or later carry everything along with it. . . ."

"This government meddling with wheat and with cotton in the endeavor to maintain an artificial level of values, no matter how well intentioned, constitutes the most serious obstacle to business recovery, since intelligent and observing persons are afraid of the outcome and dread the inevitable consequences."

If disarmament is agreed to, Theodore H. Price declares, in *Commerce and Finance*, the effect on business as well as domestic and international politics may be electric.

Active Furnaces Increase in Number

Net Gain in January Was 16—Daily Output Was Less Than December by 304 Tons or 1/3 of One Per Cent

THERE was a sharp increase in the number of active furnaces in January, but so many of them blew in late in the month that the increase in output was not sufficient to bring the January total above that of December. The decrease from December was only about 1/3 of one per cent. From data collected on Feb. 4, largely by wire, and with all furnaces

heard from except one, estimated by THE IRON AGE, the January output of coke pig iron was 2,827,464 gross tons or 91,209 tons per day. This compares with 2,836,916 tons or 91,513 tons per day in December, both 31-day months. The January decrease therefore was only 304 tons per day or 1/3 of one per cent. The next smallest January was in 1922 when the daily

output was 53,063 tons. The next lowest production for any month was the 86,960 tons per day in December, 1927. A year ago the daily rate was 111,044 tons.

There was a net gain of 16 furnaces—19 blown in and three shut down. This compares with a net loss of 46 furnaces in November and December. Of the 19 furnaces blown in,

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1926—Gross Tons

	1926	1927	1928	1929	1930
Jan.	106,974	100,123	92,573	111,044	91,209
Feb.	104,408	105,024	100,004	114,507	.....
Mar.	111,032	112,366	103,215	119,822	.....
Apr.	115,004	114,074	106,183	122,087	.....
May	112,304	109,385	105,931	125,745	.....
June	107,844	102,988	102,733	123,908	.....
½ year...	109,660	107,351	101,763	119,564	.....
July	103,978	95,199	99,091	122,100	.....
Aug.	103,241	95,073	101,180	121,151	.....
Sept.	104,543	92,498	102,077	116,585	.....
Oct.	107,553	89,810	108,832	115,745	.....
Nov.	107,890	88,279	110,084	106,047	.....
Dec.	99,712	86,960	108,705	91,513	.....
Year	107,043	99,266	103,382	115,851	.....

Pig Iron Production by Districts, Gross Tons

	Jan. (31 days)	Dec. (31 days)	Nov. (30 days)	Oct. (31 days)
New York and Mass....	193,367	176,191	229,850	243,702
Lehigh Valley.....	85,835	77,314	73,856	84,676
Schuylkill Valley.....	68,439	68,512	73,321	75,303
Lower Susq. and Lebanon Valleys.....	30,320	37,428	35,332	37,405
Pittsburgh district....	613,745	609,148	646,461	772,236
Shenango Valley.....	47,518	48,425	63,297	93,928
Western Pennsylvania..	100,256	103,671	121,833	154,451
Maryland, Va. and Ky..	98,331	98,296	120,346	120,428
Wheeling district.....	113,867	131,594	105,272	130,217
Mahoning Valley.....	220,567	220,143	293,706	371,718
Central and North'n Ohio	268,861	254,161	338,978	370,967
Southern Ohio.....	49,679	44,702	49,462	48,835
Illinois and Indiana....	583,161	589,465	644,039	706,489
Mich., Minn., Mo., Wis., Colo. and Utah.....	130,146	141,869	148,281	148,837
Alabama.....	220,781	229,857	228,021	219,015
Tennessee.....	2,591	6,140	9,356	9,911
Total	2,827,464	2,836,916	3,181,411	3,588,118

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
January, 1929.....	85,530	25,514	111,044
February	89,246	25,261	114,507
March	95,461	24,361	119,822
April	95,680	26,407	122,087
May	100,174	25,571	125,745
June	99,993	23,915	123,908
July	98,044	24,056	122,100
August	98,900	22,251	121,151
September	95,426	21,159	116,585
October	93,644	22,101	115,745
November	83,276	22,771	106,047
December	68,152	23,361	91,513
January, 1930	71,447	19,762	91,209

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

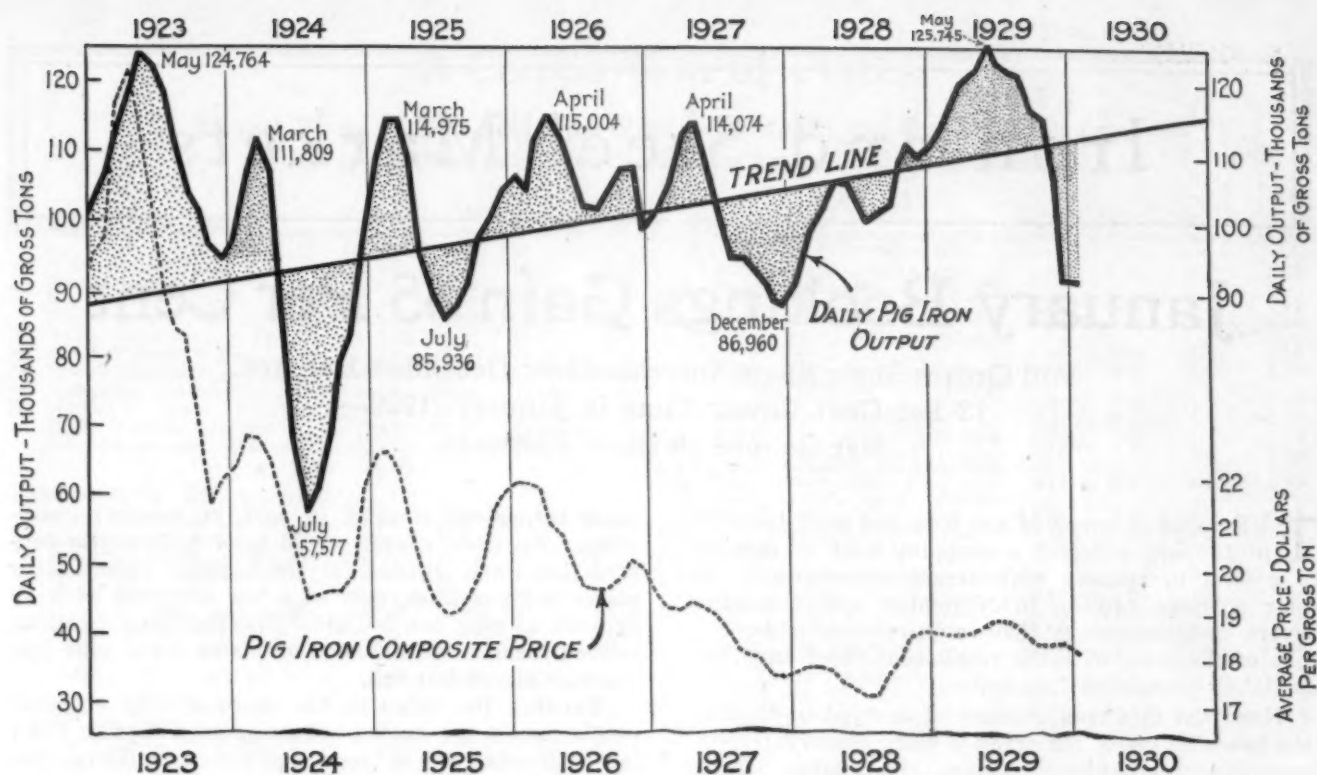
	Feb. 1 Number in Blast	Gross Tons per Day	Jan. 1 Number in Blast	Gross Tons per Day
New York:				
Buffalo	10	5,200	9	4,515
Other N. Y. and Mass...	3	1,030	3	1,065
New Jersey	0	.....	0	.....
Pennsylvania:				
Lehigh Valley	6	3,250*	5	2,470*
Schuylkill Valley	6	2,755	4	2,055
Susquehanna Valley ...	2	980	2	1,205
Lebanon Valley	0	.....	0	.....
Ferromanganese	0	.....	0	.....
Pittsburgh District	30	19,460	30	19,000
Ferro. and Spiegel...	3	500	3	625
Shenango Valley	4	2,080	2	1,190
Western Pennsylvania..	6	2,945	6	2,955
Ferromanganese	2	290	2	405
Maryland	5	3,200	4	2,665
Wheeling District	6	3,675	6	3,620
Ohio:				
Mahoning Valley	14	8,325	10	6,390
Central and Northern..	15	8,675	15	9,700
Southern	4	1,600	4	1,440
Illinois and Indiana....	30	20,615	26	17,670
Mich., Wis. and Minn....	5	2,380	5	2,400
Colo., Mo. and Utah....	4	1,820	3	1,475
Ferromanganese	0	.....	1	70
The South:				
Virginia	1	240	1	220
Ferromanganese	1	95	1	95
Kentucky	0	.....	0	.....
Alabama	16	7,640	14	6,820
Tennessee	0	.....	1	200
Total	173	96,755	157	88,250

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1928—Gross Tons

	1928	1929	1930
Jan.	2,869,761	3,442,370	2,827,464
Feb.	2,900,126	3,206,185	.....
Mar.	3,199,674	3,714,473	.....
Apr.	3,185,504	3,662,625	.....
May	3,283,856	3,898,082	.....
June	3,082,000	3,717,225	.....
½ year.....	18,520,921	21,640,960	.....
July	3,071,824	3,785,120	.....
Aug.	3,136,570	3,755,680	.....
Sept.	3,062,314	3,497,564	.....
Oct.	3,373,806	3,588,118	.....
Nov.	3,302,523	3,181,411	.....
Dec.	3,369,846	2,836,916	.....
Year*	37,837,804	42,285,769	.....

*These totals do not include charcoal pig iron. The 1928 production of this iron was 142,960 gross tons.



Daily Production Still at Lowest Rate Since December, 1927

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 1,275,000 tons

12 of them were started after Jan. 19 with several of them during the last week.

Operating Rate on Feb. 1

Estimated operating rate of the 173 furnaces blowing on Feb. 1 was 96,755 tons per day. This compares with 88,250 tons daily for the 157 furnaces active on Jan. 1. This is a gain of 8505 tons per day in operating rate on Feb. 1 over Jan. 1.

Of the 19 furnaces blown in during January five were Steel Corporation stacks and eight are credited to independent steel companies. There were six merchant furnaces lighted. The three furnaces blown out were one independent steel company and two merchant stacks. Thus there was

a net gain of 12 steel-making and of four merchant furnaces.

Sharp Gain in Steel-Making Iron

Reflecting the increase in steel-making pig iron furnaces blown in, there was an expansion in steel-making iron in January of 4.8 per cent over December. The daily rate last month was 71,447 tons against 68,152 tons in December. For January there was a small loss in merchant iron—3599 tons per day or 1.5 per cent.

Ferromanganese output in January was 27,260 tons, the smallest since September, 1929. It compares with a monthly average of 28,000 tons last year.

Furnaces Blown In and Out

Among the furnaces blown in dur-

ing January were one Lackawanna furnace of the Bethlehem Steel Corporation in the Buffalo district; one Bethlehem furnace of the Bethlehem Steel Corporation in the Lehigh Valley; one furnace of the Alan Wood Steel Co. and the Delaware River furnace in the Schuylkill Valley; one Aliquippa furnace of the Jones & Laughlin Steel Corporation in the Pittsburgh district; one furnace at the Maryland plant of the Bethlehem Steel Corporation in Maryland; two furnaces of the Republic Iron & Steel Co., one Hubbard furnace of the Youngstown Sheet & Tube Co., and the Cherry Valley furnace in the Mahoning Valley; the Sharpsville furnace and one Shenango furnace in the Shenango Valley; three Gary furnaces and one Joliet furnace of the Illinois Steel Co. in the Chicago district, and one furnace of the St. Louis Gas & Coke Co. in Illinois; one Ensley furnace of the Tennessee Coal, Iron & Railroad Co. and one Woodward furnace of the Woodward Iron Co. in Alabama.

Only three furnaces were shut down during January: the Neville Island furnace in the Pittsburgh district; one Iroquois furnace of the Youngstown Sheet & Tube Co. in the Chicago district; and the Rockwood furnace of the Roane Iron Co. in Tennessee.

National Foreign Trade Council will hold its annual foreign trade convention at the Hotel Biltmore, Los Angeles, Cal., May 21, 22 and 23.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1928	1929	1930	1928	1929	1930
Jan.	2,155,133	2,651,416	2,214,875	22,298	28,208	27,260
Feb.	2,274,880	2,498,901	.....	19,320	25,978	.....
Mar.	2,588,158	2,959,295	.....	27,912	24,978	.....
Apr.	2,555,500	2,826,028	.....	18,405	22,413	.....
May	2,652,872	3,105,404	.....	29,940	25,896	.....
June	2,448,905	2,999,798	.....	32,088	33,363	.....
½ year	14,675,448	17,040,842	.....	149,963	160,836	.....
July	2,464,896	3,039,370	.....	32,909	31,040	.....
Aug.	2,561,904	3,065,874	.....	24,583	28,461	.....
Sept.	2,477,695	2,862,799	.....	22,278	27,505	.....
Oct.	2,729,589	2,902,960	.....	23,939	31,108	.....
Nov.	2,654,211	2,498,291	.....	29,773	31,866	.....
Dec.	2,647,863	2,112,704	.....	28,618	28,564	.....
Year	30,211,606	33,522,840	.....	312,063	339,380	.....

*Includes output of merchant furnaces.

Iron and Steel Markets

January Bookings Gain 45 Per Cent

Mill Orders Show Sharp Increase Over December But Are
13 Per Cent Lower Than in January, 1929—
Net Gain of 16 Blast Furnaces

THE rapid recovery of the iron and steel industry in January reflected a snapping back of demand to a level in keeping with actual consumption. In their extreme caution in November and December buyers underestimated their requirements after the turn of the year, with the result that these were immediately translated into orders.

Now that this readjustment of demand to production has been made, the trade is more conservative in forecasting further improvement. In Chicago, where steel ingot output has reached 88 per cent of capacity, additional increases in operations are predicted, but in other important producing districts the outlook for February is for a very gradual rise at the most.

The general rate of steel ingot production, computed from telegraphic reports to THE IRON AGE, is now 76.7 per cent of capacity. The returns, which came from companies accounting for more than 75 per cent of the country's output, showed rates varying from 55 to 90 per cent, with all but two producers reporting 70 per cent or better and only one more than 85 per cent.

Mill bookings in January, not including unspecified contract tonnage, were much larger than in December, but fell short of those of the first month of 1929. The gain over December, in terms of a weighted average for 18 companies, was 45.5 per cent; the decline from January, 1929, was 13.25 per cent.

All companies reported increases over December, two of them gains exceeding 100 per cent and several others advances of 60 to 80 per cent. Only one showed a gain of less than 20 per cent. The comparisons with January, 1929, were mixed, although most of them showed declines, varying from 4 to as much as 40 per cent.

The quick rebound of production is indicated by blast furnace returns for January. With 19 stacks blown in and three put out, there was a net gain of 16, but two-thirds of the furnaces lighted were put into commission after Jan. 19. On Feb. 1, 173 furnaces were producing at the rate of 96,755 tons a day, compared with 157 stacks making 88,250 tons daily Jan. 1.

The late gains in furnaces, however, did not prevent production for the entire month from showing a loss compared with December. The January total was 2,827,464 tons or 91,209 tons a day, compared with 2,836,916 tons, or 91,513 tons a day, in the previous month—a loss of 1/3 of 1 per cent. The January average per day is the lowest for any month since December, 1927, and the smallest for a first month since 1922.

The volume of steel specifications in the imme-

diate future will depend, in part, on weather conditions. An open winter would tend to expedite construction work planned for the spring. Demand for plates for gas lines, now at a low ebb, will pick up as soon as pipe can be laid. Specifications awaiting release include 100,000 tons of plates for a pipe line contract placed last fall.

Pending the bulge in the more strictly seasonal requirements, the market is getting good support from the railroads, the railroad equipment builders, the automobile industry, the structural shops and the farm machinery makers.

Rail mill operations at Chicago now range from 85 to 90 per cent. New business is confined mainly to small orders, but specifications are mounting as the rail-laying season approaches. The week's bookings in track fastenings at Chicago bulked large, totaling 25,000 tons.

The excellent backlogs of railroad equipment builders have been swelled by orders for 11,500 freight cars, requiring 140,000 tons of steel, placed by the Chesapeake & Ohio and associated lines.

Fabricated steel bookings aggregated 52,500 tons compared with 53,000 tons in the previous week.

The automotive industry is increasing its production schedules faster than was expected a few weeks ago. A General Motors Corporation subsidiary, which recently placed orders for sheets for Feb. 15-March 15 delivery, has asked mills to ship the steel as rapidly as it can be produced.

Prices show the mixed trend characteristic of transition periods. In some districts greater firmness is evident in plates and shapes. On the other hand, irregularities persist in sheet prices and wire nails have declined \$1 a ton to \$2.25 a keg, Cleveland or Pittsburgh. Concessions in semi-finished steel have been followed by a formal reduction of \$1 a ton on billets, slabs and sheet bars. Wire rods have been shaded \$2 a ton to \$38, Pittsburgh.

In the pig iron market, demand is spotty and pressure against prices has not relaxed. Alabama producers, who are reported to have stock accumulations of 300,000 tons, are again invading Northern districts. Sales in the St. Louis district brought out prices as low as \$13, Birmingham; in the New York metropolitan area \$12.50 was quoted.

Scrap is stronger, with advances of 25c. a ton in heavy melting grade at Pittsburgh, Chicago and Cleveland. The rise at Pittsburgh offsets the decline of a week ago.

Furnace coke at Connellsville has gone up 10c. a ton to \$2.60.

THE IRON AGE composite prices are unchanged, pig iron at \$18.17 a ton and finished steel at 2.305c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Feb. 4, 1930	Jan. 28, 1930	Jan. 7, 1930	Feb. 5, 1929
No. 2 fdy., Philadelphia.....	\$20.76	\$20.76	\$20.76	\$21.76
No. 2, Valley furnace.....	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti.....	17.69	17.69	17.69	20.19
No. 2, Birmingham.....	14.50	14.50	14.50	16.50
No. 2 foundry, Chicago*.....	20.00	20.00	20.00	20.00
Basic, del'd eastern Pa.....	19.50	19.50	19.50	19.75
Basic, Valley furnace.....	18.50	18.50	18.50	17.50
Valley Bessemer, del'd P'gh..	20.76	20.76	20.76	20.01
Malleable, Chicago*.....	20.00	20.00	20.00	20.00
Malleable, Valley.....	19.00	19.00	19.00	18.00
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace.....	100.00	100.00	100.00	105.00

Rails, Billets, Etc., Per Gross Ton:	Feb. 4, 1930	Jan. 28, 1930	Jan. 7, 1930	Feb. 5, 1929
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh..	33.00	34.00	34.00	33.00
Sheet bars, Pittsburgh.....	33.00	34.00	34.00	34.00
Slabs, Pittsburgh.....	33.00	34.00	34.00	33.00
Forging billets, Pittsburgh...	38.00	39.00	39.00	38.00
Wire rods, Pittsburgh.....	40.00	40.00	40.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.85	1.85	1.85	1.90

Finished Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.90	1.90
Bars, Chicago.....	1.95	1.95	2.00	2.00
Bars, Cleveland.....	1.85	1.85	1.90	1.90
Bars, New York.....	2.19	2.19	2.24	2.24
Tank plates, Pittsburgh.....	1.80	1.80	1.90	1.90
Tank plates, Chicago.....	1.95	1.95	2.00	2.00
Tank plates, New York.....	2.07 1/2	2.02 1/2	2.12 1/2	2.17 1/2
Structural shapes, Pittsburgh..	1.80	1.80	1.90	1.90
Structural shapes, Chicago...	1.95	1.95	2.00	2.00
Structural shapes, New York...	2.04 1/2	2.04 1/2	2.09 1/2	2.14 1/2
Cold-finished bars, Pittsburgh..	2.10	2.10	2.30	2.20
Hot-rolled strips, Pittsburgh..	1.80	1.80	1.80	1.80
Cold-rolled strips, Pittsburgh..	2.65	2.65	2.65	2.85

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel, Per Lb. to Large Buyers:	Feb. 4, 1930	Jan. 28, 1930	Jan. 7, 1930	Feb. 5, 1929
	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh...	2.60	2.60	2.75	2.85
Sheets, black, No. 24, Chicago				
dist. mill.....	2.75	2.75	2.85	2.95
Sheets, galv., No. 24, P'gh...	3.30	3.30	3.40	3.60
Sheets, galv., No. 24, Chicago				
dist. mill.....	3.40	3.40	3.50	3.70
Sheets, blue, No. 13, P'gh...	2.25	2.25	2.25	2.20
Sheets, blue, No. 13, Chicago				
dist. mill.....	2.35	2.35	2.45	2.30
Wire nails, Pittsburgh.....	2.25	2.30	2.40	2.65
Wire nails, Chicago dist. mill.	2.35	2.35	2.45	2.70
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill.	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh.....	2.95	2.95	3.05	3.30
Barbed wire, galv., Chicago				
dist. mill.....	3.00	3.00	3.10	3.35
Tin plate, 100 lb. box, P'gh...	\$5.25	\$5.25	\$5.25	\$5.35

Old Material, Per Gross Ton:	Feb. 4, 1930	Jan. 28, 1930	Jan. 7, 1930	Feb. 5, 1929
Heavy melting steel, P'gh....	\$16.75	\$16.50	\$16.75	\$18.75
Heavy melting steel, Phila....	14.50	14.50	14.50	16.50
Heavy melting steel, Ch'go....	13.00	12.75	12.75	16.00
Carwheels, Chicago.....	14.25	14.00	13.75	14.50
Carwheels, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Pittsburgh.....	14.50	14.50	14.50	15.00
No. 1 cast, Philadelphia.....	15.00	15.00	15.00	16.50
No. 1 cast, Ch'go (net ton)...	13.50	13.50	13.50	16.50
No. 1 RR. wrot., Phila.....	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)..	12.00	12.00	12.00	14.50

Coke, Connellsville, Per Net Ton at Oven:	Feb. 4, 1930	Jan. 28, 1930	Jan. 7, 1930	Feb. 5, 1929
Furnace coke, prompt.....	\$2.60	\$2.50	\$2.60	\$2.75
Foundry coke, prompt.....	3.50	3.50	3.50	3.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	18.12 1/2	18.12 1/2	18.12 1/2	17.62 1/2
Electrolytic copper, refinery..	17.75	17.75	17.75	17.25
Tin (Straits), New York.....	39.12 1/2	39.37 1/2	39.62 1/2	50.37 1/2
Zinc, East St. Louis.....	5.25	5.30	5.30	6.35
Zinc, New York.....	5.60	5.65	5.65	6.70
Lead, St. Louis.....	6.10	6.10	6.10	6.50
Lead, New York.....	6.25	6.25	6.25	6.65
Antimony (Asiatic), N. Y....	8.75	8.87 1/2	8.37 1/2	9.75

Pittsburgh

Steel Gains in February Expected to Be at Slower Rate— No Slackening Yet in Specifications

PITTSBURGH, Feb. 4.—While the beginning of the new month has brought no slackening in the rate of steel specifications and apparent increases in strip steel and cold-finished steel bars, the confidence which characterized the steel trade during January does not seem so pronounced. Steel makers would see no cause for alarm in a check in the rate of specifications at this time and still feel that the spring months will see the industry return to its normal operating status for that time of the year.

Nevertheless, it seems now that the rate of improvement of both specifications and operations which characterized January can hardly be continued this month, and a few of the smaller companies which increased open-hearth operations very sharply last month have taken off furnaces in the last week. In many cases steel ingot operations were increased more rapidly than finishing mill schedules, as stocks of steel were very low at the year end. Now steel is plentiful and some readjustment was necessary.

Steel ingot operations in the district average about 75 per cent this week. In one or two plants all available open-hearth furnaces are in operation, but the larger companies are much nearer the general average. No steel company blast furnaces were blown in during January in the immediate Pittsburgh district. Sheet mills are running at about 70 per cent and slightly higher in the Valleys. Tin mills are now scheduled rather steadily at 75 per cent, following a slight reduction in the last two weeks, but January specifications enabled producers to build up fair backlogs. Operations of hot-rolled strip units are higher at approximately 60 per cent of capacity, while cold-rolling mills have shown no marked improvement. Bar mills are running at 50 to 60 per cent, while plate and shape mills are engaged at a much better rate. Business in the heavier products continues

to improve and rail and structural mills have definite assurance of a steadily increasing rate for some time to come.

Prices still lack strength, although some products are well established at recently reduced levels. Bars, plates and shapes in this district are gradually gaining strength at 1.85c., Pittsburgh, with the lower quotations exceptional. Weakness has developed in wire nails and wire rods, although most producers deny an open break in the market. Sheet prices are badly demoralized in the Detroit territory, but no changes of importance are reported in Pittsburgh.

An encouraging factor in the price situation has been the unwillingness of mills to contract at the extremely low prices which have been current, and business taken at these figures will be shipped immediately in most cases. Talk of higher prices is heard, but advances are not likely before the end of the quarter in the present state of the market.

Pig Iron.—Buying is still confined mostly to small lots for immediate shipment, with sales of more than 200 or 300 tons rather exceptional. In all reported cases the full quoted prices of \$18.50, Valley, for foundry and ba-

sic iron, and \$19 for malleable and Bessemer are holding. Nevertheless, the market cannot be called particularly strong, as lower quotations in nearby districts have narrowed the natural territory of the Valley furnaces, and they must shade their prices in many instances to meet this competition. It is difficult to say whether the Pittsburgh market would hold in case a large inquiry came out, as merchant furnaces are frankly in need of backlog orders, and some of the steel companies which are not ordinarily sellers of iron would quite likely be willing to take a substantial tonnage of basic. Shipments to foundries are showing some improvement, although a few of the largest users in the district are still operating at a very low rate. Non-integrated steel companies are still increasing their pig iron requirements, and some merchant furnaces are able to reduce their stock piles as a result. The Davison Coke & Iron Co. has blown in its Sharpsville furnace, and is now operating two stacks in the Valley.

Prices per gross ton, f.o.b. Valley furnace:	
Basic	\$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:	
Basic	\$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

Semi-Finished Steel.—The price of billets, slabs and sheet bars has been reduced \$1 a ton, and the market is now nominally quoted at \$33, Pittsburgh or Youngstown. There is still little buying at this figure, but it is thought to be more satisfactory to consumers than previous quotations, and would likely stand the test of all buying, except large contract business. Shipments of semi-finished are improving steadily as non-integrated mills step up their operations, but a few fourth quarter contracts are still good for some additional tonnage. Forging billets are now quoted at \$38, main-

taining the usual \$5 differential over rerolling billets, and shipments are fairly good. Wire rods are unchanged at \$40 a ton, Pittsburgh or Cleveland, and, if any adjustments have been made in this price, following the reduction in wire nails, they have accommodated companies which make a product competitive to the sellers of rods.

Bars, Shapes and Plates.—Business is improving, and the last week has brought added clarification to the price situation. Plates and shapes, which a short time ago were considerably weaker than bars, have strengthened somewhat, and the bulk of the tonnage now being placed commands 1.85c., Pittsburgh. Bars, on the other hand, have become fairly well established at 1.85c., and, although the 1.90c. price still applies to carload lots, the lower figure is generally representative of the market. Lower quotations are heard in the Detroit territory, but are confined largely to that district. Specifications from the railroad car builders in this territory are maintaining recent improvement, and are up to the expectations of most producers. However, car builders still have considerable business on their books for which steel shipments will not begin for some time, and Pittsburgh companies are expected to benefit materially by the orders of the Van Sweringen roads, which may be placed this week. Barge business is dull, but a number of inquiries are said to be in the offing. The Fort Pitt Bridge Co. was awarded the contract for a bridge across the Ohio River at McKees Rocks, Pa., which will take 13,000 tons of shapes. A bridge at Detroit for the Pere Marquette Railroad will take 1400 tons. The largest fabricating shops in the district are well engaged, but some of the smaller companies are in need of tonnage.

Rails and Track Supplies.—Specifications for track accessories were heavy in January, and, although a part of this tonnage might have been expected to develop at the beginning of the year, the volume of business was better than had been expected. With the rail laying season close at hand, shipments are expected to in-

crease steadily in the next few weeks, and the situation is viewed optimistically by most makers of rail and track supplies. Light rails are in slight demand, and the price is weak, largely because of the competition of rerolling mills. In some instances, this has resulted in cuts of \$2 a ton on the quoted price of \$36, Pittsburgh.

Tubular Goods.—The pipe business is still marking time, although February is expected to see a continuance of the improvements reported last month. Several line pipe projects are in prospect, and, although no action is expected until spring on most of them, pipe makers are already figuring on some of this business. Standard butt weld pipe is seasonally quiet, and shipments of seamless material to the oil country are not heavy. Demand for mechanical tubing is showing some improvement, but the automobile industry is not yet placing sufficient tonnage to make for heavy volume.

Wire Products.—The heavy movement of merchant wire products, which was reported in the early weeks of January, has subsided somewhat, but this was to have been expected, in view of price changes and replenishment of stocks. Demand for manufacturers' wire continues to be fairly good, and is improving from week to week. On this business, the \$2.40, Pittsburgh, price is holding, and there is some question regarding the \$2.30 to \$2.40 price on wire nails.

Sheets.—The sheet business has not changed materially in the last week, although improved specifications from the automobile industry are reported by a few makers. Prices seem to be somewhat better established, and shading is confined largely to the Detroit territory. In other districts, leading makers are turning down business in black sheets which does not bring 2.65c., Pittsburgh, and most of them are holding the 3.30c. to 3.40c. range on galvanized sheets. In fact, the official price of a large maker of galvanized sheets is still 3.40c. Blue annealed sheets and light plates are now generally quoted at 2.25c. and 2.10c., Pittsburgh, while the continuous mill product has sold as low as

THE IRON AGE Composite Prices

Finished Steel

Feb. 4, 1930, 2.305c. a Lb.

One week ago	2.305c.
One month ago	2.362c.
One year ago	2.391c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1929	2.412c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

Feb. 4, 1930, \$18.17 a Gross Ton

One week ago	\$18.17
One month ago	18.21
One year ago	18.38

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1929	\$18.71, May 14;	\$18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel	
Base per Lb.	
F.o.b. Pittsburgh mill.....	1.85c. to 1.90c.
F.o.b. Chicago	1.95c. to 2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York.....	2.19c. to 2.24c.
Del'd Cleveland.....	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna.....	2.00c.
F.o.b. Birmingham	2.00c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c.

Billet Steel Reinforcing	
F.o.b. Pittsburgh mills, 40, 50, 60-ft.....	1.95c.
F.o.b. Pittsburgh mills, cut lengths.....	2.20c.
F.o.b. Birmingham, mill lengths.....	2.00c.

Rail Steel	
F.o.b. mills, east of Chicago dist.....	1.80c. to 1.90c.
F.o.b. Chicago Heights mill.....	1.85c.
Del'd Philadelphia	2.12c. to 2.22c.

Iron	
Common iron, f.o.b. Chicago.....	1.95c. to 2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

Tank Plates

Base per Lb.	
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago	1.95c. to 2.00c.
F.o.b. Birmingham	2.00c.
Del'd Cleveland	1.99c. to 2.04c.
Del'd Philadelphia.....	2.00c. to 2.05c.
F.o.b. Coatesville	1.90c. to 1.95c.
F.o.b. Sparrows Point.....	1.90c. to 1.95c.
F.o.b. Lackawanna.....	1.90c. to 1.95c.
Del'd New York.....	2.07½c. to 2.12½c.
C.i.f. Pacific ports	2.25c.

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago	1.95c. to 2.00c.
F.o.b. Birmingham	2.00c.
F.o.b. Lackawanna	1.90c. to 1.95c.
F.o.b. Bethlehem	1.90c. to 1.95c.
Del'd Cleveland	2.04c.
Del'd Philadelphia.....	1.86c. to 2.01c.
Del'd New York.....	2.04½c. to 2.09¼c.
C.i.f. Pacific Ports.....	2.35c.

Hot-Rolled Hoops, Bands and Strips

Base per Lb.	
6 in. and narrower, P'gh.....	1.90c.
Wider than 6 in., P'gh.....	1.80c.
6 in. and narrower, Chicago.....	2.00c. to 2.10c.
Wider than 6 in., Chicago.....	1.90c. to 2.00c.
Cooperage stock, P'gh.....	2.20c.
Cooperage stock, Chicago.....	2.30c.

Cold-Finished Steel

Base per Lb.	
Bars, f.o.b. Pittsburgh mill.....	2.10c. to 2.20c.
Bars, f.o.b. Chicago.....	2.10c. to 2.20c.
Bars, Cleveland	2.10c. to 2.20c.
Bars, Buffalo	2.10c. to 2.20c.
Shafting, ground, f.o.b. mill.....	2.45c. to 3.40c.
Strips, P'gh.....	2.75c. to 2.85c.
Strips, Cleveland	2.65c. to 2.75c.
Strips, del'd Chicago.....	2.95c.
Strips, Worcester	2.80c. to 2.90c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.00c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
To Merchant Trade

Base per Keg	
Standard wire nails.....	\$2.25 to \$2.30
Cement coated nails.....	2.30 to 2.40
Galvanized nails	4.30 to 4.40

Base per Lb.	
Polished staples	2.75c. to 2.85c.
Galvanized staples	3.00c. to 3.10c.
Barbed wire, galvanized.....	2.95c. to 3.05c.
Annealed fence wire.....	2.45c. to 2.55c.
Galvanized wire, No. 9.....	2.90c. to 3.10c.
Woven wire fence (per net ton to retailers)	\$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage.....	2.40c.
Spring wire	3.50c.
(Carload lots, f.o.b. Chicago)	
Wire nails	\$2.35 to \$2.45 (keg)
Annealed fence wire.....	2.50c. to 2.60c. (lb.)
Bright hard wire to manufacturing trade.....	2.45c.
Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.	

Cut Nails

Per 100 Lb.	
Carloads, Wheeling, Reading or Northumberland, Pa.....	\$2.70
Less carloads, Wheeling or Reading.....	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh.....	2.10c.
No. 10, blue annealed, f.o.b. Chicago dist.....	2.20c.
No. 10, blue annealed, del'd Phila.....	2.42c.
No. 10, blue annealed, B'ham.....	2.25c.

Sheets

Blue Annealed	
Base per Lb.	
No. 13, f.o.b. P'gh.....	2.25c.
No. 13, f.o.b. Chicago dist.....	2.35c.
No. 13, del'd Philadelphia.....	2.57c.
No. 13, blue annealed, B'ham.....	2.50c.

Continuous Mill Sheets	
No. 10 gage, f.o.b. P'gh.....	1.90c. to 2.00c.
No. 13 gage, f.o.b. P'gh.....	2.00c. to 2.15c.

Box Annealed, One Pass Cold Rolled	
No. 24, f.o.b. Pittsburgh	2.60c. to 2.75c.
No. 24, f.o.b. Chicago dist. mill.....	2.75c. to 2.85c.
No. 24, del'd Philadelphia	2.92c. to 3.07c.
No. 24, f.o.b. Birmingham.....	2.90c.

Metal Furniture Sheets	
No. 24, f.o.b. P'gh.....	4.00c.

Galvanized	
No. 24, f.o.b. Pittsburgh	3.30c. to 3.40c.
No. 24, f.o.b. Chicago dist. mill.....	3.40c. to 3.50c.
No. 24, del'd Cleveland	3.49c. to 3.59c.
No. 24, del'd Philadelphia	3.62c. to 3.72c.
No. 24, f.o.b. Birmingham.....	3.50c.

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill.....	3.00c. to 3.10c.

Automobile Body Sheets	
No. 20, f.o.b. Pittsburgh	3.90c.

Long Ternes	
No. 24, 8-lb. coating, f.o.b. mill.....	3.90c. to 4.00c.

Vitreous Enameling Stock	
No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

Per Base Box	
Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C. \$10.70	25-lb. coating I.C. \$15.90
15-lb. coating I.C. 13.40	30-lb. coating I.C. 16.80
20-lb. coating I.C. 14.60	40-lb. coating I.C. 18.80

Alloy Steel Bars

(F.o.b. makers' mill)	
Alloy Quantity Bar Base, 2.65c. per Lb.	
S.A.E. Series	
Numbers	Alloy Differential
2000 (½% Nickel).....	\$0.25
2100 (1½% Nickel).....	0.55
2300 (3½% Nickel).....	1.50
2500 (5% Nickel).....	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bars.....	1.20
6100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and squares.....	0.50
Chromium Nickel Vanadium.....	1.50
Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

Per Gross Ton	
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Chgo mill.....	36.00

Track Equipment

Base per 100 Lb.	
Spikes, ½ in. and larger.....	\$2.80
Spikes, ¼ in. and smaller.....	2.90
Spikes, boat and barge.....	3.00
Tie plate, steel.....	2.07½

Angle bars	\$2.75
Track bolts, to steam railroads.....	\$3.50 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld					
Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
7/8	45	19 1/2	1/4 and 3/8 ..	+11	+36
1/4 to 3/8 ..	51	25 1/2	1/2	23	5
1/2	56	42 1/2	3/4	28	11
3/4	60	48 1/2	1 and 1 1/4 ..	31	15
1 to 3	62	50 1/2	1 1/2 and 2 ..	35	18

		Lap Weld			
2	55	43½	2	23	9
2½ to 6...	59	47½	2½ to 3½	28	13
7 and 8...	56	43½	4 to 6....	30	17
9 and 10...	54	42½	7 and 8...	29	16
11 and 12.	53	40½	9 to 12...	26	11

Butt Weld, extra strong, plain ends					
1½	.....	41	24½	2 to 3.....	61 50½
1½	to ¾.....	47	30½	¾ and ¾ +13	+48
2	.....	53	42½	½.....	23 7
2½	.....	58	47½	¾.....	28 12
3	to 1½.....	60	49½	1 to 2.....	34 18

Lap Weld, extra strong, plain ends					
2	53	42½	1½	29	13
2½ to 4..	57	46½	2½ to 4..	34	20
4½ to 6..	56	45½	4½ to 6..	33	19
7 to 8....	52	39½	7 and 8...	31	17
9 and 10..	45	32½	9 to 12...	21	8
11 and 12..	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh	
Steel	Charcoal Iron
Inches	Inches
2 in. and 2½ in.	38
2½ in.—2¾ in.	46
3 in.	52
3½ in.—3¾ in.	54
4 in.	57
4½ in. to 6 in.	46
1½ in.	1
1¾ in.	3
2 in.—2¼ in.	13
2½ in.—2¾ in.	16
3 in.	17
3½ in. to 3¾ in.	18
4 in.	20
4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two-fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
Inches	Inches
1 in.	61
1½ to 1¾ in.	53
1¾ in.	37
2 to 2¼ in.	32
2½ to 2¾ in.	40
3 in.	46
3½ to 3¾ in.	48
4 in.	51
4½, 5 and 6 in.	40

Hot Rolled	
Inches	Inches
2 and 2½ in.	38
2½ and 2¾ in.	46
3 in.	52
3½ to 3¾ in.	54
4 in.	57
4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List	
Carbon, 0.10% to 0.30%, base (carloads) ..	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

1.90c., Pittsburgh, for the No. 10 gage. The automobile body sheet price continues at 3.90c., although one large buyer in the Detroit district is said to be able to place business at less. Implement makers are still taking sheets at a good rate and the specifications of railroad car builders are gradually improving. It is still too early in the season for manufacturers of building materials to be in the market in a large way, although early estimates of their requirements are encouraging. Radio makers are taking very few sheets at this time, and the industry is not expected to be a large consumer for several months. Other sheet consuming lines are requiring fair tonnages, and any increase in the business of the automobile companies would immediately reflect an advance of corresponding proportions in the operating rate of the sheet industry. At present mills in Pittsburgh and nearby districts are averaging about 70 per cent of capacity.

Tin Plate.—Heavy January specifications are reported by most makers and some of them accumulated fair-sized backlogs which assure a continuance of the present rate of operations throughout February. However, part of this tonnage will not be shipped until March and mills hesitate to work too far ahead on their orders at this time. The average operating rate of the district is about 75 per cent of capacity, with some of the independents maintaining a slightly higher figure.

Strip Steel.—Specifications of some makers improved rather sharply in the last week and mill operations were generally stepped up in the industry this week. As a result, hot-mills are scheduled at better than 60 per cent, with cold-rolling units at around 40 per cent. However, demand for cold-rolled material is still very disappointing to some makers and fails to show the improvement reported on hot-rolled products, except in the case of mills which do a large specialty business. Prices have gained strength, but are still subject to shading in some territories. The general market on cold-rolled strip is no higher than 2.65c., Pittsburgh, in the Detroit territory, but small tonnages are bringing a better figure in some localities. The 1.80c., Pittsburgh, price on the wider sizes of hot-rolled strip has been shaded in a few instances, but 1.90c. is holding on the narrow widths. Mills report occasional lots sold at prices \$2 a ton over these figures and still carry some tonnage on their books at this figure.

Cold-Finished Steel Bars.—Specifications from the automobile industry are better, although far from satisfactory. The reduction in price announced a short time ago has brought in some business from consumers who apparently are convinced that the market is not likely to go lower than 2.10c., Pittsburgh.

Coke.—The market on furnace coke has strengthened and most producers have withdrawn the \$2.50, Connells-

ville, price on spot tonnages, which was common a week ago. The market is now quotable at \$2.60, and sales at this figure have not met with much resistance on the part of buyers. Foundry coke is still dull and prices are indeterminate. Shipments in January fell far behind the corresponding month last year. Heating coke is in good demand and occasional makers have withdrawn from the market.

Old Material.—The market has gained strength in the last week, a sale of a fairly large tonnage, possibly 15,000 tons, to a mill in this district at \$16.50, which was divided among three dealers, has tightened the situation, and No. 1 heavy melting steel is no longer easy to buy at prices which have been fairly common up until the beginning of this week. Dealers are reported to be offering \$16.50 to \$16.75 to cover against recent orders at Pittsburgh district consuming points, and \$17, delivered, is reported to have been paid in the East for heavy melting steel directed to Pittsburgh. In view of this, the market is quotable at 25c. a ton higher than it was last week, even though a \$17 figure is hardly justified on the basis of actual sales to mills at this price. The closing of the railroad lists later in the week will doubtless clarify the situation, but there is a strong supposition that the heavy melting steel on the Pennsylvania list will bring a very good price at one or two consuming points which are known to be in need of first quality scrap. Hydraulic compressed sheets are not quotably higher, although the market has recovered from the weakness which characterized it last week. It is not easy to buy steel in Detroit for shipment to Pittsburgh at much less than \$16.50, delivered at local consuming points, although production of scrap is increasing in the Detroit district. Sales

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	2.90c. to 3.00c.
Structural shapes	2.90c. to 3.00c.
Soft steel bars and small shapes	2.80c. to 2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.60c.
Galv. sheets (No. 24), 25 or more bundles	4.25c.
Light plates, blue annealed (No. 10), 1 to 24 plates	3.25c.
Blue annealed sheets (No. 13), 1 to 24 sheets	3.40c.
Galv. corrug. sheets (No. 28), per square	4.13c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list	
Machine bolts, 100 count, 60 per cent off list	
Carriage bolts, 100 count, 60 per cent off list	
Nuts, all styles, 100 count, 60 per cent off list	
Large rivets, base per 100 lb	\$3.50
Wire, black, soft ann'd, base per 100 lb.	\$2.75 to 2.85
Wire, galv. soft, base per 100 lb.	3.20 to 3.30
Common wire nails, per keg	2.60 to 2.75
Cement coated nails, per keg	2.65 to 2.80

of other grades have been of little consequence, and prices are generally unchanged. Steel car axles are stronger. The monthly list of the Norfolk & Western, which closes Feb. 12, contains about 7000 tons of scrap.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel.....	\$16.50 to \$17.00
No. 2 heavy melting steel.....	14.50 to 15.00
Scrap rails	16.00 to 16.50
Compressed sheet steel.....	16.25 to 16.50
Bundled sheets, sides and ends	14.00 to 14.50
Cast iron carwheels.....	14.50 to 15.00
Sheet bar crops, ordinary.....	18.00 to 18.50
Heavy breakable cast.....	12.00 to 12.50
No. 2 railroad wrought.....	16.25 to 16.75
Hvy. steel axle turnings.....	14.00 to 14.50
Machine shop turnings.....	11.50 to 12.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	20.00 to 21.00
Railr. coil and leaf springs	20.00 to 21.00
Rolled steel wheels.....	20.00 to 21.00
Low phos. billet and bloom ends	21.00 to 22.00
Low phos. mill plates.....	20.50 to 21.00
Low phos. light grades.....	19.50 to 20.50
Low phos. sheet bar crops	20.50 to 21.00
Heavy steel axle turnings.....	14.00 to 14.50
Electric Furnace Grades:	
Low phos. punchings.....	18.50 to 19.50
Hvy. steel axle turnings.....	14.00 to 14.50
Blast Furnace Grades:	
Short shoveling steel turnings	12.00 to 12.50
Short mixed borings and turnings	12.00 to 12.50
Cast iron borings.....	12.00 to 12.50
Rolling Mill Grades:	
Steel car axles.....	20.50 to 21.50
Cupola Grades:	
No. 1 cast.....	14.00 to 15.00
Rails 3 ft. and under.....	18.50 to 19.50

Columbia Steel Mills to Diversify Products

The United States Steel Products Co., the export subsidiary of the United States Steel Corporation, which also handles Pacific Coast business, will operate the plants of the Columbia Steel Corporation, recently acquired by the United States Steel Corporation, and will sell the products of the Columbia mills. The Western business will be conducted as the United States Steel Products Co.—Columbia Department. Offices will be maintained in San Francisco and Los Angeles, Cal.; Portland, Ore.; Seattle, Wash.; Salt Lake City, Utah, and Phoenix, Ariz. The operation of warehouses will be continued.

An announcement says that "it is proposed to increase the facilities of the Columbia Steel Corporation and further diversify their products, enabling the broadening of service in the Pacific Coast territory."

Bethlehem Steel Acquires Danville Rerolling Mill

The Bethlehem Steel Co. has taken over the business and property of the Danville Structural Steel Co., Inc., Danville, Pa. The plant consists of a rerolling mill having a capacity of approximately 2500 tons a month and employs about 200 men. Its operations will be conducted as a division of Bethlehem plant at Steelton, Pa.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms		Sheet Bars		Skelp	
Per Gross Ton		(Open Hearth or Bessemer)		(F.o.b. Pittsburgh or Youngstown)	
Rerolling, 4-in. and under 10-in., Pittsburgh	\$33.00	Pittsburgh	Per Gross Ton \$33.00	Grooved	Per Lb. 1.85c. to 1.90c.
Rerolling, 4-in. and under 10-in., Youngstown	33.00	Youngstown	33.00	Universal	1.85c. to 1.90c.
Rerolling, 4-in. and under 10-in., Cleveland	33.00	Cleveland	33.00	Sheared	1.85c. to 1.90c.
Rerolling, 4-in. and under 10-in., Chicago	34.00				
Forging quality, Pittsburgh.....	38.00				

Prices of Raw Material

Ores		Ferromanganese		Fluxes and Refractories	
Lake Superior Ores, Delivered Lower Lake Ports		Per Gross Ton		Fluorspar	
Old range Bessemer, 51.50% iron.....	\$4.80	Domestic, 80%, seaboard.....	\$100.00	Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines.....	\$18.00
Mesabi Bessemer, 51.50% iron.....	4.65	Foreign, 80%, Atlantic or Gulf port, duty paid	100.00	No. 2 lump, Illinois and Kentucky mines..	20.00
Mesabi non-Bessemer, 51.50% iron.....	4.50			Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	\$18.25 to 18.75
High phosphorus, 51.50% iron.....	4.40			Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silica, f.o.b. Illinois and Kentucky mines.....	32.50
Foreign Ore, c.i.f. Philadelphia or Baltimore					
Per Unit					
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian.....	12.00c.				
Iron ore, low phos., Swedish, average 68% iron	12.00c.				
Iron ore, basic Swedish, average 65% iron	10.00c.				
Manganese ore, washed, 52% manganese, from the Caucasus.....	30.00c.				
Manganese ore, Brazilian, African or Indian, basic 50%.....	30.00c.				
Tungsten ore, high grade, per unit, in 60% concentrates	\$15.50 to \$16.50				
Per Gross Ton					
Chrome ore, 45 to 50% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00				
Per Lb.					
Molybdenum ore, 85% concentrates of MoS ₂ , delivered	50c. to 55c.				
Coke		Electric Ferrosilicon		Fire Clay Brick	
Per Net Ton		Per Gross Ton Delivered		Per 1000 f.o.b. Works	
Furnace, f.o.b. Connellsville prompt	\$2.60	50%	\$83.50	High-Heat Intermediate Duty Brick Heavy Duty Brick	
Foundry, f.o.b. Connellsville prompt	3.50 to 4.75	75%	130.00		
Foundry, by-product, Chgo ovens	8.00				
Foundry, by-product, New England, del'd	11.00				
Foundry, by-product, Newark or Jersey City, delivered.....	9.00 to 9.40				
Foundry, by-product, Phila.....	9.00				
Foundry, Birmingham	5.00				
Foundry, by-product, St. Louis, f.o.b. ovens	8.00				
Foundry by-prod., del'd St. Louis..	9.00				
Coal		Bessemer Ferrosilicon		Silica Brick	
Per Net Ton		F.o.b. Jackson County, Ohio, Furnace		Per 1000 f.o.b. Works	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.25 to \$1.75	Per Gross Ton	Per Gross Ton		
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75	10%	\$30.00	Pennsylvania	\$43.00
Gas coal, 1/4-in. f.o.b. Pa. mines...	1.90 to 2.00	11%	32.00	Chicago	52.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75			Birmingham	50.00
Steam slack, f.o.b. W. Pa. mines...	80c. to 90c.			Silica clay, per ton.....	\$8.50 to 10.00
Gas slack, f.o.b. W. Pa. mines....	1.00 to 1.10				

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts		Bolts and Nuts		Small Rivets	
Per 100 Pieces		Per Cent Off List		(3/4-in. and smaller)	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)		Semi-finished hexagon nuts.....	70	F.o.b. Pittsburgh	Per Cent Off List 70 and 10
		Semi-finished hexagon castellated nuts, S.A.E. 70	70	F.o.b. Cleveland	70 and 10
		Stove bolts in packages, Pgh.....	75, 20, 10 and 5	F.o.b. Chicago	70 and 10
		Stove bolts in packages, Chicago.....	75, 20, 10 and 5		
		Stove bolts in packages, Cleveland.....	75, 20, 10 and 5		
		Stove bolts in bulk, Pgh.....	75, 20, 10, 5 and 2 1/2		
		Stove bolts in bulk, Chicago.....	75, 20, 10, 5 and 2 1/2		
		Stove bolts in bulk, Cleveland.....	75, 20, 10, 5 and 2 1/2		
		Tire bolts	60, 5 and 5		
		Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.			
Per Cent Off List		Large Rivets		Cap and Set Screws	
†Machine bolts	70	(1/2-in. and larger)		Per Cent Off List	
†Carriage bolts	70	Base per 100 Lb.		Milled cap screws.....	80, 10 and 5
Lag bolts	70	F.o.b. Pittsburgh or Cleveland.....	\$3.10	Milled standard set screws, case hardened, 80 and 5	
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70	F.o.b. Chicago	3.20	Milled headless set screws, cut thread.....	75 and 10
Hot-pressed nuts, blank or tapped, square.....	70			Upset hex. head cap screws, U.S.S. thread, 85 and 10	
Hot-pressed nuts, blank or tapped, hexagons.....	70			Upset hex. cap screws, S.A.E. thread.....	85 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	70			Upset set screws.....	80, 10 and 5
Washers*	7.00c. to 6.75c. per lb. off list			Milled studs	70

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including 3/4 in. x 6 in. take 10 per cent lower list prices.

Chicago

Steel Sales Mounting, Pressure for Shipments Increases as Production Is Stepped Up

CHICAGO, Feb. 4.—Pressure for shipments of steel is increasing, and deliveries are falling back in spite of employment of added capacity, which brings ingot production in the Chicago district to within a point or two of 90 per cent of full rating.

Of special importance is the fact that sales are mounting, giving evidence of greater confidence on the part of consumers. New purchases compare favorably with the best weeks in 1929. Specifications for finished steel more than support the current rate of output and schedules now arranged for February delivery forecast heavier shipments. Prompt shipments of most steel mill products are now almost out of the question, unless orders match with rolling schedules. Promises of deliveries have backed up a week in the last seven days.

The foremost producer is now making use of 17 of 27 blast furnaces, a gain of two this week. The count for the district stands at 26 active steel company furnaces of 36. A year ago there were 27 steel mill stacks in blast.

The support of this market is coming from many sources. Car builders' needs are important and shipments to automobile manufacturers and parts makers are measurably heavier. Little support is being given to the structural market by local awards, but tonnages accumulated by local mills from outlying territory are attractive. Two tractor manufacturers are bringing in new production units and are calling for correspondingly larger shipments of steel. Plate tonnages for pipe line manufacture are not yet a factor in this market, but it is reported that protection is being sought on deliveries against a contract placed late last year, which calls for 100,000 tons of plates.

All told, the Chicago steel market is in a strong position. Some producers foresee congestion at mills in March and April. One seller reports specifications in January 40 per cent heavier than the total in December, but 18 per cent smaller than in the first month in 1929.

Pig Iron.—Of foremost interest in this market is the increased melt by malleable foundries. Late in January this industry was very spotty, but in the last week or 10 days releases for malleable iron have been freely issued. Lack of interest in forward buying late in the old year resulted in bringing January sales to a high peak. This definitely reflects the lifting of the dullness and uncertainty that overhung the market near the close of 1929. The shipment curve for Northern foundry iron is pointing upward, as gaged by releases for the remainder of February. Occasional small lots of charcoal and Southern iron are being placed at current quotations.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25..	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75..	20.50
Malleable, not over 2.25 sil.....	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50.....	27.04
S'th'n No. 2 fdy. (all rail).....	\$19.01 to 19.51
Low phos., sil. 1 to 2, copper free..	29.50
Silvery, sil. 8 per cent.....	\$28.79 to 29.79
Bess. ferrosilicon, 14-15 per cent...	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Sheets.—Obligations at Western sheet mills remain light, as consumers hold steadfastly to the practice of placing orders only for immediate needs. The inflow of business showed little variation in the past week and the rate of output and promises of delivery are practically unchanged. Specifications from barrel and container manufacturers are heavier this week and agricultural implement builders are taking larger quantities of sheets for machinery on which production is being stepped up. Prices are unchanged.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.80c. to 2.90c.; No. 24 galv., 3.45c. to 3.55c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cast Iron Pipe.—Demand for cast iron pipe is slowly expanding in the West. Orders for lots of 50 to 100 tons each are more numerous and there is greater promise of active buying by many municipalities. Considerable tonnage is still pending from the public utilities, which have normal programs under way, but which are unusually slow in closing. Among new projects are 700 tons of 6 to 12-

in. pipe for St. Paul, Minn.; 2000 ft. of 2-in., 5000 ft. of 6-in. and 1200 ft. of 8-in. pipe for Fort Dodge, Iowa, and 100 tons of 2 to 8-in. pipe for Muscatine, Iowa. Prices for 6-in. and larger diameter pipe range from \$36 to \$38 a ton, Birmingham.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$44.20; 4-in., \$46.20; Class A and gas pipe, \$3 extra.

Rails and Track Supplies.—Rail rolling programs for the next few months are now arranged. Output, which is slowly being advanced, stands in the range of 85 to 90 per cent of capacity. Rail buying is at a standstill this week, but track supply orders bulk large, the aggregate being well over 25,000 tons. The outlook for additional business in track accessories is favorable.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. **Per lb.:** Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars, 2.75c.

Plates.—The principal support of the local plate market is coming from car shops, which are freely entering specifications for all but the latest orders taken. Releases have been issued this week for 50,000 tons of steel needed for cars for the Rock Island. Car shops have placed contracts for 30,000 tons, which will be used in the construction of the 2300 cars ordered last week by the Milwaukee road. Close to 12,000 tons of steel will be required for 1000 tank cars ordered recently by a tank car line. It is reported here that the Chesapeake & Ohio and subsidiaries may place before the end of the week the 11,500 cars on which prices have been taken. Although at the moment shipments of plates for line pipe are an unimportant factor in this market, the outlook is good for a sharp upturn in demand from this direction. Heavy snows and frozen ground are holding in check construction work on pipe lines. One contract for a gas line placed late last year calls for 100,000 tons of plates, which will be taken from Western mills as soon as the weather moderates and after several minor technical matters are finally arranged. It is said that the pipe manufacturing interest which has this contract is now seeking protection on deliveries, which are steadily being pushed into the future. A week ago some sizes of plates could be had promptly, while other sizes could be promised in three to four weeks. During the past week specifications were unusually heavy, and deliveries have been delayed from a week to 10 days. It is reported here that a group of business men at Omaha and officers of the Southern Union Gas Co. are reviving the project for constructing a 500-mile gas line between Amarillo, Tex., and Omaha, Neb. Inquiries for plates for storage tanks grow from week to week. A new project, which will take 3000 tons, is in the market. Estimates have been prepared for work of this character

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforc'g bars, billet steel—	
Under 5 tons.....	2.85c.
5 tons to 30 tons.....	2.45c.
30 tons and over.....	2.00c.
Rail steel reinforcement.....	1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands (½ in. in Nos. 10 and 12 gages).....	3.20c.
Hoops (No. 14 gage and lighter).....	3.75c.
Black sheets (No. 24).....	4.05c.
Galv. sheets (No. 24).....	4.60c.
Blue ann'l'd sheets (No. 10).....	3.35c.
Spikes, ½ in. and larger.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	4.00c.
Rivets, boiler.....	4.00c.
Per Cent Off List	
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, sq., tap. or blank..	60
Hot-pressed nuts, hex., tap. or blank..	60
No. 8 black ann'l'd wire, per 100 lb..	\$3.45
Com. wire nails, base per keg.....	\$2.85 to 2.95
Cement c'd nails, base per keg.....	2.85 to 2.95

calling for close to 20,000 tons of plates.

Structural Material.—This market continues to mark time both in inquiries and awards. The structural business in and near Chicago is unusually dull, and there is little prospect that improvement will come in the very near future. Scattered orders from outlying territory tributary to Chicago mills are satisfactory to local producers. Among the most active projects of size are 1700 tons for a power house at Springfield, Ill., and 700 tons for a street railway viaduct at Milwaukee. In Chicago and in most other fabricating centers in the Middle West, shops are operating with reduced forces and on a shortened week. A situation of this kind leads to intensive competition, and the result is that prices being obtained by fabricators are in many cases unusually low. Deliveries on shapes range from two to four weeks, the deferred dates being named on the range of sizes most commonly used in car construction.

Mill prices on plain material, per lb.: 1.95c. to 2.00c. base, Chicago.

Bolts, Nuts and Rivets.—Output of 70 per cent of capacity is well sustained by current specifications. Use of these commodities by automobile manufacturers is heavier and specifications are liberal from car shops and the railroads.

Old Material.—Such strength as is shown in the local scrap market is quite evidently the result of limitation of supplies. Most large consumers bought heavily when prices were at or near the low point and, even with rather strict specifications, they were able to build sizable stock piles before the upturn of steel production. These accumulations are being used to support buyers' resistance to the higher prices that are in the minds of sellers. On this score, advances are slow in coming and moderate in amount. Heavy melting steel has advanced 25c. on sales aggregating more than 10,000 tons. These orders were well scattered among brokers who are already actively covering at prices which appear to wipe out profits. Small users of scrap, especially in western Michigan, continue to draw on Chicago for needed tonnages. Much of this activity is the result of an expanding demand for automobile parts. Railroad shipments of cast scrap are not keeping pace with demand and a shortage of this grade now exists. Cast iron borings remain inactive, following the recent sale at \$10.25 a ton, delivered consumer's yard. Some sellers continue to think of higher prices for this grade, but shipments are larger as industry swings into heavier production; consumers are showing little interest in the market. Although the weather has moderated, it seems probable, in view of the severity of the winter, that railroad gathering of scrap has been hampered. This is now reflected in the comparatively small size of lists being offered by Western rail-

roads. Some dealers look for shipments to be light through most of February. The Santa Fe is closing a list for 4000 tons.

*Prices deliv'd Chicago district consumers:
Per Gross Ton*

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$13.00 to \$13.50
Shoveling steel	13.00 to 13.50
Frogs, switches and guards, cut apart, and misc. rails	14.00 to 14.50
Hydraul. compressed sheets	11.75 to 12.25
Drop forge flashings.....	9.75 to 10.25
No. 1 busheling.....	11.00 to 11.50
Forg'd cast and r'l'd steel carwheels	17.50 to 18.00
Railroad tires, charg. box size	17.50 to 18.00
Railroad leaf springs cut apart	17.50 to 18.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	16.00 to 16.50
Coil springs	18.25 to 18.75
Electric Furnace Grades:	
Axle turnings	12.75 to 13.25
Low phos. punchings.....	15.50 to 16.00
Low phos. plates, 12 in. and under	15.50 to 16.00
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings.....	9.75 to 10.25
Short shoveling turnings..	9.75 to 10.25
Machine shop turnings....	7.75 to 8.25
Rolling Mill Grades:	
Iron rails	14.50 to 15.00
Rerolling rails	15.00 to 15.50
Cupola Grades:	
Steel rails less than 3 ft..	16.75 to 17.25
Steel rails less than 2 ft..	18.50 to 19.00
Angle bars, steel.....	15.50 to 16.00
Cast iron carwheels.....	14.25 to 14.75
Malleable Grades:	
Railroad	17.00 to 17.50
Agricultural	14.50 to 15.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms	17.00 to 17.50
Iron car axles.....	25.50 to 26.00
Steel car axles.....	16.00 to 16.50
No. 1 railroad wrought...	12.00 to 12.50
No. 2 railroad wrought...	11.50 to 12.00
No. 1 busheling.....	9.00 to 9.50
No. 2 busheling.....	7.00 to 7.50
Locomotive tires, smooth...	14.50 to 15.00
Pipes and flues.....	9.50 to 10.00
Cupola Grades:	
No. 1 machinery cast.....	13.50 to 14.00
No. 1 railroad cast.....	13.00 to 13.50
No. 1 agricultural cast.....	12.00 to 12.50
Stove plate	10.75 to 11.25
Grate bars	10.75 to 11.25
Brake shoes	10.75 to 11.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Wire Products.—Shipments of wire and wire products in January were about 5 per cent below the tonnage moved in the first month of last year. However, demand is on the increase, especially from the manufacturing trade. Output, which stood between 50 and 55 per cent of capacity a week ago, is now close to 58 per cent average. Bookings for heavy electrical cables are unusually large and much new business is in sight. Demand for magnet wire is light, largely because this is the off season for the manufacture of radio equipment.

Bars.—Demand for soft steel bars is active and prospects are excellent for shipments to expand. Deliveries, which ranged from prompt to three weeks late last month, are now not better than three to four weeks for most sizes. Prices are steady at 1.95c. to 2c. a lb., Chicago. Specifications for alloy steel bars continue to grow, and output has gained several points to an average of 65 per cent

of capacity. The iron bar market is spotty, both in new buying and specifications against old orders. Prices for rail steel bars are well established at 1.85c., Chicago Heights. Demand is active from most buyers, who are insistent on prompt attention being given to small and mixed orders.

Reinforcing Bars.—Of special interest in this market is a movement by reinforcing bar dealers to announce prices for large tonnages not now covered by published quotations. One seller of billet steel reinforcing bars has in mind naming 2c. a lb. as the warehouse price for lots of 30 tons each and larger. One seller of rail steel reinforcement is publishing 1.75c. a lb. as the quotation for tonnages of similar size. Both inquiries and orders for small lots are more numerous, but attractive tonnages, though reported to be in the making, are slow in coming before the trade. Shop schedules are light as the second month of the year starts. New contracts and fresh inquiries are given on page 482.

Coke.—Melt of foundry iron continues to make heavy drafts against the make of by-product foundry coke. All local ovens are lighted. Prices, which are tested only by occasional odd lots, are steady at \$8, f.o.b. ovens.

Ferroalloys.—Activity in this market is confined almost wholly to specifications, which continue to grow heavier. With most consumers covered by contract, there is practically no interest in new buying.

Wickwire-Spencer Sells Its Wire Goods Department

The Wickwire-Spencer Steel Co., Buffalo, N. Y., has sold to the Washburn Co., Chicago, its kitchen wire goods department. The Washburn Co. has for about 50 years been engaged in the manufacture of wire and stamped hardware, particularly household articles. In divorcing itself from the specialized manufacture of such wire goods, the Wickwire-Spencer company is following a policy of eliminating departments of its business that do not fit in well with its steel manufacturing lines.

National Steel to Build Rail Mill

The National Steel Corporation, Pittsburgh, will construct a new mill for standard rails, splice bars, tie plates, structural steel, angles and merchant bars at the Weirton Steel Co. plant at Weirton, W. Va., according to an announcement by Ernest T. Weir, chairman of the board.

The new rail mill will be part of the \$6,000,000 expansion program which the company is undertaking at its Weirton subsidiary this year. The mill will be in operation next fall, and will further diversify the finishing operations of the Weirton plant.

New York

Eastern Mills Stiffen Quotations on Plates—Pig Iron Melt Is Gaining Slightly

NEW YORK, Feb. 4.—While there is no great pressure for pig iron and orders, for the most part, are uncovered only after careful canvassing of the trade, bookings in this district, at 7500 tons, duplicated the total of the previous week. Foundry operations are very spotty, with some melters operating at a low rate and others running fairly well. In the aggregate, melt still seems to be gaining, although very slowly. Competition remains keen, with sellers of Alabama iron more aggressive. On attractive tonnages, \$12.50 to \$13, base Birmingham, has been quoted. Buffalo foundry iron is bringing \$16.50, base furnace, and eastern Pennsylvania brands are offered in this district at competitive prices at points of delivery. A Providence, R. I., melter is in the market for 1000 tons of foundry iron, but with that exception no important open inquiries are reported. A Delaware River pipe foundry recently placed 10,000 tons with the Mystic furnace.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil.	1.75	
to 2.25		\$21.41 to \$21.91
*Buff. No. 2, del'd east.		
N. J.	19.78 to 20.28	
East. Pa. No. 2 fdy., sil.		
1.75 to 2.25		19.89 to 21.02
East. Pa. No. 2X fdy., sil.		
2.25 to 2.75		20.39 to 21.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

Finished Steel.—Mill bookings continue to show some increase in the aggregate, but the rate of gain is slower than during the last half of January. Demand is still spotty, reflecting an uneven condition among consuming lines. Prices are also irregular, with further weakness in some directions offset by evidences of strength in others. Recent sharp concessions failed to stimulate plate demand to any marked extent and mills have taken a firmer position, quoting 1.90c. to 1.95c., Coatesville, or 2.07½c. to 2.12½c., New York. Sheets are still soft, with larger buyers obtaining 2.55c., Pittsburgh, on black sheets, 2.05c. on light plates and 2.20c. on No. 13 blue annealed. Important jobbers have succeeded in buying galvanized sheets at 3.25c. and 3.20c., Pittsburgh, but the market is being held at 3.30c. for the manufacturing trade. Wire nails are now more commonly available at \$2.25 a keg, or \$1 a ton under the recent prevailing market level. Buyers of wire rods in this district have succeeded, in some instances, in purchasing their requirements at \$38 a gross ton, Pittsburgh, which represents a recession of \$2 a ton. Notwithstanding these developments, sellers believe that the decline in the market has about run its course. As mills become better booked they are less disposed to "buy" tonnage. The

amount of structural steel work pending is of encouraging proportions, and railroad car buying is keeping up at a good rate. The Chesapeake & Ohio, Pere Marquette and Hocking Valley, which placed orders for 11,500 freight cars today, have issued inquiries for 91 passenger service cars. The two other Van Sweringen roads, the Erie and the Nickel Plate, are also expected to enter the market for freight and passenger car equipment. Among all the finished products, tin plate probably is making the best showing in specifications in this district. Demand for merchant pipe is considered normal for this season, but it is too early for jobbers to build up their stocks in preparation for spring trade. The Richmond, Fredericksburg & Potomac has placed 8500 tons of rails with the Bethlehem Steel Corporation.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.07½c. to 2.12½c.; structural shapes, 2.04½c. to 2.14½c.

Cast Iron Pipe.—Prices of pressure pipe are being maintained more firmly than for some months past, but buying has declined slightly. This decrease is attributed to the fact that most of the large private companies have covered their major requirements for the year, while municipalities have not yet entered the market to any extent. A fair tonnage of business is being booked from industrial users of cast iron pipe, which are usually buyers of small lots. Syracuse, N. Y., is asking for bids on a carload of pipe and a carload of fittings. Erie, Pa., will open bids Feb. 11 on 500 tons of 4 to 20-in. pipe and 700 to 1000 tons of 24-in. pipe for delivery during the year. An oil company is inquiring for a small tonnage of pipe for delivery to its refinery in Texas. An export inquiry for Cuba calls for about 100 tons of 18-in. water pipe.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, \$38.60; 4-in. and 5-in., \$41.60; 3-in., \$48.60. Class A and gas pipe \$3 extra.

Warehouse Business.—New York warehouses have adopted new lists of extras on cold-finished steel bars, including alloy bars, and have changed the method of quoting base prices. Rounds, recently quoted at 3.50c. a lb., are now 3.40c., while hexagons, which took the same base price as rounds, are now classed with flats and squares, all taking a base price of 3.90c. Flats and squares were 4c., S.A.E. 3100 series chrome nickel bars are quoted at 6.55c., base, a lb., and S.A.E. 2300 series 3½ per cent nickel steel bars at 7.50c. a lb. Cold-rolled strip steel has been reduced to 5.05c. a lb. Cutting charges on cold-finished bars have been increased. A schedule of cutting charges gives a minimum of 35c. on rounds ¾ in. and under, with a charge of 2c. per cut. On 8-in. rounds the charge for one cut is \$1.75 and the minimum is \$1.80. On inter-

mediate sizes, the charges vary according to the size of the bar. Similar schedules have been worked out for flats, squares and hexagons. For cold-finished alloy steel bars the charges are doubled. Extras for special finishes (rounds only) are double the mill extras and the extras

Warehouse Prices, f.o.b. New York

Base per Lb.	
Plates and structural shapes.....	3.30c.
Soft steel bars, small shapes.....	3.25c.
Iron bars.....	3.24c.
Iron bars, Swed. charcoal.....	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds.....	3.40c.
Flats, squares and hexagons.....	3.90c.
Cold-roll. strip, soft and quarter	
hard.....	5.05c.
Hoops.....	4.25c.
Bands.....	3.75c.
Blue ann'l'd sheets (No. 10).....	3.25c. to 3.90c.
Long terme sheets (No. 24).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galv. annealed.....	5.15c.
Tire steel, ½ x ½ in. and larger.....	3.40c.
Smooth finish, 1 to 2½ x ¼ in.	
and larger.....	3.75c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Per Cent Off List	
Machine bolts, cut threads:	
¾ x 6 in. and smaller.....	60
1 x 30 in. and smaller.....	50 to 50 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller.....	60
¾ x 20 in. and smaller.....	50 to 50 and 10
Coach Screws:	
¾ x 6 in. and smaller.....	60
1 x 6 in. and smaller.....	50 to 50 and 10
Bolter Tubes—	Per 100 Ft.
Lap welded, 2-in.....	\$19.00
Seamless steel, 2-in.....	20.25
Charcoal iron, 2-in.....	26.25
Charcoal iron, 4-in.....	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt.....	46	29
¾-in. butt.....	51	37
1-3-in. butt.....	53	39
2½-6-in. lap.....	48	35
7 and 8-in. lap.....	44	17
11 and 12-in. lap.....	37	12
Wrought Iron—		
½-in. butt.....	5	+19
¾-in. butt.....	11	+9
1-1½-in. butt.....	14	+6
2-in. lap.....	5	+14
3-6-in. lap.....	11	+6
7-12-in. lap.....	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box...	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC.....	\$9.70	\$12.10
IX.....	12.00	14.25
IXX.....	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25

Sheets, Box Annealed—Black, C. R.

One Pass		Per Lb.
Nos. 18 to 20.....	3.60c. to 3.70c.	
No. 22.....	3.75c. to 3.85c.	
No. 24.....	3.80c. to 3.90c.	
No. 26.....	3.90c. to 4.00c.	
No. 28*	4.05c. to 4.15c.	
No. 30.....	4.30c. to 4.40c.	

Sheets, Galvanized

Per Lb.	
No. 14.....	4.00c. to 4.15c.
No. 16.....	3.85c. to 4.00c.
No. 18.....	4.00c. to 4.15c.
No. 20.....	4.10c. to 4.25c.
No. 22.....	4.20c. to 4.35c.
No. 24†.....	4.35c. to 4.50c.
No. 26.....	4.60c. to 4.75c.
No. 28*	4.85c. to 5.00c.
No. 30.....	5.25c. to 5.40c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
†For 50 bundles or more, 25c. per 100 lb. or less.

for accuracy are also double those charged by the mills. Complete lists of extras are being supplied to the buyers in the district.

Coke.—Occasional distress carloads of furnace coke are still being offered at \$2.50 per ton, Connellsville. Quotations usually range from \$2.65 to \$2.75 a net ton, Connellsville. Special brands of beehive foundry coke are \$4.85 a net ton, ovens, or \$8.56, delivered to northern New Jersey, Jersey City and Newark, and \$9.44 to New York and Brooklyn. By-product coke is quoted at \$9 to \$9.40 a net ton, Newark or Jersey City, and \$10.06, New York or Brooklyn.

Old Material.—Prices of all grades of scrap are substantially unchanged in a quiet market. Consumers are not inclined to enter into contracts except at lower than present quotations, and sellers are unwilling to commit themselves for tonnage which they might not be able to furnish profitably. No. 1 heavy melting steel is still being

bought at \$14 a ton, delivered eastern Pennsylvania, and a fair tonnage is being shipped for export, especially to Japan.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel.	\$10.50 to \$11.35
Heavy melting steel (yard)	7.50 to 8.00
No. 1 hvy. breakable cast.	9.75 to 10.50
Stove plate (steel works).	8.00
Locomotive grate bars.	8.25
Machine shop turnings.	7.00 to 7.50
Short shoveling turnings.	7.25 to 7.50
Cast borings (blast fur. or steel works).	7.00 to 7.50
Mixed borings and turnings.	6.75 to 7.50
Steel car axles.	15.25 to 16.25
Iron car axles.	20.50 to 21.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	9.25 to 9.75
Forge fire.	8.50 to 9.00
No. 1 railroad wrought.	11.50 to 12.50
No. 1 yard wrought, long.	10.50 to 11.50
Rails for rolling.	10.50 to 11.00
Stove plate (foundry).	8.25 to 8.50
Malleable cast (railroad).	12.50 to 13.00
Cast borings (chemical).	8.50 to 9.50
<i>Prices per gross ton, deliv'd local foundries:</i>	
No. 1 machry. cast.	\$15.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size.	13.00
No. 2 cast (radiators, cast boilers, etc.)	12.50

While Cleveland furnaces commonly quote foundry and malleable iron at \$18.50, furnace, for shipment in their immediate territory, sales have been made at \$18 for delivery to competitive points, where local furnaces have a freight disadvantage. In Michigan, the market is unchanged at \$19.50 to \$20.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	\$19.50
S'th'n fdy., sil. 1.75 to 2.25	19.51
Malleable	19.50
Ohio silvery, 8 per cent.	28.00
Basic Valley furnace.	18.50
Stand. low phos., Valley.	26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

Semi-Finished Steel.—The leading Cleveland producer has reduced prices on sheet bars, billets and slabs \$1 a ton to \$33, Cleveland, and is revising \$34 contracts to the lower price. This reduction follows irregularity that has appeared in the market for the past two or three weeks. Specifications are coming out in good volume, and the Cleveland producer is now operating 13 of its 14 open-hearth furnaces and reports that it has enough orders to maintain this operation for 14 days.

Coke.—Specifications against foundry coke contracts are coming out somewhat better than recently. Demand for by-product coke for domestic use has fallen off and is expected to be rather slow during the remainder of the season. Ohio by-product foundry coke is quoted at \$8.25, ovens, for February shipment.

Strip Steel.—Specifications for hot-rolled strip steel have further gained and several mills increased operations the past week. There is little, if any, change in the price situation. Hot-rolled strip is commonly quoted at 1.80c., Pittsburgh, for 6-in. and wider. Material narrower than 6 in. is somewhat firmer than wide strip. While 1.90c. is rather generally named for the narrow strip, some small-lot business is going at 2c. There seems to be no deviation from the 2.65c., Cleveland, price on cold-rolled strip.

Bars, Plates and Shapes.—Steel bars are in very good demand from motor car manufacturers and parts makers. Plates are moving fairly well in small lots. Structural shapes continue rather quiet. Not much building work is coming out in this territory, and local fabricating shops have little to do. The Lorain Central bridge is the only large local project in prospect, and an inquiry has come out for 400 tons of piling and bracing for the bridge piers. Locomotive shops have started to place steel for the 120 Van Sweringen locomotives. Not much question is being raised at present as to prices, which appear well stabilized at 1.85c., Cleveland, for steel bars and 1.85c., Pittsburgh, for plates and structural shapes.

Sheets.—Demand further increased during the week, and some of the mills are now operating at close to capacity, although little, if any, backlog is being accumulated. Not only is larger

Cleveland

Automotive Industry Increasing Production Schedules and Steel Orders—Cleveland Mills at 90 Per Cent

CLEVELAND, Feb. 4.—Demand is holding up in good volume for carbon and alloy bars. Sheet orders have gained and hot and cold-rolled strip steel also show an improvement. Three additional open-hearth furnaces were put on in Cleveland during the week, and the local independent mills now are operating at close to 90 per cent of ingot capacity. Canton-Massillon mills are running at about 75 per cent of capacity, as compared with a low point of 40 per cent in December.

With the gain in orders the latter part of the month, January steel business in this territory reached a normal volume for that month. While mill operations have been increased at about the same rate as the gain in tonnage, some of the bar mills have been able to accumulate a little backlog of orders and cannot make as prompt shipments as recently. The automotive industry continues to step up production and is responsible for most of the increase in steel tonnage.

Some of the motor car manufacturers evidently are enlarging their production schedules faster than they expected to a few weeks ago. A Cleveland General Motors unit, making stampings for Chevrolet bodies, which recently placed orders for sheets for its Feb. 15-March 15 requirements, has instructed mills to disregard previous shipping orders and ship all the sheets as soon as they can be produced. Similar instructions have been issued by some of the jobbing stamping manufacturers. Many consumers still have low stocks and ask for quick deliveries.

The only important price change during the week was a reduction of \$1 a ton to \$33, Cleveland, for sheet bars, billets and slabs, reflecting a weakness that recently developed in the semi-finished steel market.

Pig Iron.—Sales the past week did not hold up to the volume of the two previous weeks. Cleveland interests sold 26,000 tons in foundry and malleable grades during the week. There is still considerable pressure for lower prices and the policy of buying in small

lots is being followed quite generally by many consumers who usually make contracts. The week's business was fairly well distributed, with more coming from the motor car industry than from other consumers. One Cleveland foundry purchased 2500 tons, but otherwise there was little local activity. January shipments were from 25 to 50 per cent over those of December and the daily average this month will probably show a gain over January. Prices are being well maintained.

Warehouse Prices, f.o.b. Cleveland Base per Lb.

Plates and struc. shapes.	3.00c.
Soft steel bars.	3.00c.
Reinforc. steel bars.	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.65c.
Cold-fin. flats and sq.	4.15c.
Hoops and bands, No. 12 to 14 in., inclusive.	3.25c.
Hoops and bands, No. 13 and lighter.	3.65c.
Cold-finished strip.	5.95c.
Black sheets (No. 24).	3.75c.
Galvanized sheets (No. 24).	4.50c.
Blue ann'l'd sheets (No. 10).	3.25c.
No. 9 ann'l'd wire, per 100 lb.	\$2.60
No. 9 galv. wire, per 100 lb.	3.05
Com. wire nails, base per keg.	2.65

*Net base, including boxing and cutting to length.

tonnage coming from the automotive industry, but some other consumers, including refrigerator, barrel and stove manufacturers, are becoming more active. Continuous mill sheets are now competing with the jobbing mill product for the manufacture of alcohol drums that are made of No. 16 gage stock. Inquiry includes 2000 tons of electrical sheets for making radio equipment. There is very little change in the price situation. While black sheets can be bought at 2.55c., Pittsburgh, for round lots, several mills refuse to go below 2.65c. Jobbing mills commonly quote blue annealed sheets at 2.10c. to 2.25c. for No. 10 and No. 13 gages respectively, but continuous mills are going to 1.90c. and 2.05c. Galvanized sheets continue weak, concessions to 3.25c. being reported on this grade. Concessions to 3.90c. are reported on metal furniture sheets.

Wire Products.—Demand for manufacturers' wire has gained sharply, and this product is firm at 2.40c. Nails continue to move slowly and are subject to occasional concessions.

Old Material.—Mills are now taking scrap in fair volume and this is resulting in more activity among dealers than recently. Prices are firm and show an upward tendency, recent quotations not having brought out a great deal of scrap. Dealers are paying \$14.50 and in some cases a higher price for selected No. 1 heavy melting steel to cover against purchases made a few

days ago at \$15 by a Cleveland mill. For steel-making scrap for another mill, which is less rigid in its specifications, dealers are paying \$14 for No. 1 and \$13.50 for No. 2. Borings and turnings advanced about 50c. a ton to \$11, which is being freely offered by dealers, although a local mill is trying to buy at the same price. Short shoveling turnings are also up 50c. a ton and No. 2 busheling is higher.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel.	\$13.75 to \$14.00
No. 2 heavy melting steel.	13.25 to 13.50
Compressed sheet steel.	12.50 to 13.00
Light bundled sheet stampings.	11.50 to 12.00
Drop forge flashings.	12.00 to 12.50
Machine shop turnings.	10.00 to 10.25
Short shoveling turnings.	11.00 to 11.50
No. 1 railroad wrought.	13.00 to 13.50
No. 2 railroad wrought.	14.00 to 14.50
No. 1 busheling.	12.00 to 12.50
Pipes and flues.	9.00 to 9.50
Steel axle turnings.	12.50 to 13.00

Acid Open-Hearth Grades:	
Low phos., forging crops.	17.75 to 18.00
Low phos., billet bloom and slab crops.	18.50 to 18.75
Low phos., sheet bar crops.	18.00 to 18.50
Low phos., plate scrap.	18.00 to 18.50

Blast Furnace Grades:	
Cast iron borings.	10.50 to 11.00
Mixed borings and short turnings.	10.50 to 11.00
No. 2 busheling.	10.00 to 10.50

Cupola Grades:	
No. 1 cast.	15.25 to 15.75
Railroad grate bars.	11.00 to 12.00
Stove plate.	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.50

Miscellaneous:	
Railroad malleable.	18.00 to 18.50
Rails for rolling.	16.25 to 16.50

pipe producer for 15,000 tons of pig iron, which is about 50 per cent larger than the usual purchase by this consumer. The Virginia furnace is also making some fair sales of foundry iron in the Cumberland Valley.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$20.76 to \$21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 22.26
East. Pa. No. 1X.	21.72 to 22.76
Basic (del'd east. Pa.)	19.50 to 19.75
Malleable.	21.25 to 21.75
Stand. low phos. (f.o.b. east. Pa. furnace).	24.00
Cop. b'r'g low phos. (f.o.b. furnace).	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

Bars.—Buying is limited to small lots and most of this business is at 1.90c. a lb., Pittsburgh, or 2.22c., delivered Philadelphia. Larger lots are still subject to a concession of \$1 a ton, and are quotable at 1.85c., Pittsburgh, or 2.17c., delivered Philadelphia.

Reinforcing Bars.—Competition continues keen, with billet steel bars quoted at 1.95c., Pittsburgh, or 2.27c., delivered Philadelphia, without the usual extra for cutting to length. Rail steel bars, to compete with this price are quoted at 1.80c., Franklin, Pa., and Tonawanda, N. Y., or 2.12c., delivered Philadelphia, and even this price is occasionally shaded. Contracts pending award include a school at Fifth and Fitzwater Streets, Philadelphia, 230 tons; a seaplane channel at Langley, W. Va., 545 tons, and a bridge for the Pennsylvania Railroad south of Sunbury, Pa., 112 tons.

Shapes.—Although mills have a better backlog of specifications for immediate rolling than at any time this year, prices continue a downward tendency. Most of the present buying is at 1.80c. to 1.85c. a lb., f.o.b. nearest mill to consumer, or 1.86c. to 1.91c., delivered Philadelphia, but buyers claim to have bought lots of 100 tons and more at \$1 and \$2 a ton less than the minimum quotation.

Philadelphia

Mill Operations Improve But Prices Still Are Unstable—Southern Pig Iron Competition Increases

PHILADELPHIA, Feb. 4.—Improvement in operating rates of steel mills continues, but prices still lack strength. One Eastern producer is operating its sheet mills full and a plate mill has three more open-hearth furnaces on than a week ago. Consumers are buying small tonnages of steel for immediate requirements, apparently hesitating to enter into forward commitments until the price structure shows more stability. Some fair plate tonnages are expected in the next few weeks from business recently awarded. Materials have not yet been bought for 120 locomotives recently placed by the Chesapeake & Ohio Railroad. About 900 tons of plates and shapes will be purchased shortly by the Pusey & Jones Co., Wilmington, Del., for four tow vessels. The Pennsylvania Railroad is asking for prices on an unstated tonnage of hot and cold-rolled strip steel and spring steel.

Ferromanganese.—Most consumers are covered with contracts for the remainder of the year at \$100 per ton, seaboard, for domestic or foreign ferromanganese. Domestic producers are considering a quantity differential of \$1 to \$5 or \$6 a ton, depending upon the tonnage of a contract, and it may become effective this week.

Pig Iron.—Southern foundry iron is beginning to offer increased competition, with Birmingham district furnaces estimated to have upward of 300,000 tons of iron on their yards and showing willingness to quote \$13 a ton, base, or \$19.38 a ton, delivered into this district on an all-rail rate. The National Radiator Co., Johns-

town, Pa., recently in the market for 2000 tons of foundry grade for its Trenton, N. J., plant, has awarded about half the tonnage to an eastern Pennsylvania seller and the rest to a Birmingham furnace. A small tonnage of foundry iron bought by the Ingersoll-Rand Co. for its Phillipsburg, N. J., plant, is reported to have gone to a Buffalo steel company producer. The current report that a Coatesville, Pa., steel mill has purchased 10,000 to 15,000 tons of basic iron at about \$19 a ton, delivered, lacks confirmation by either the buyer or eastern Pennsylvania sellers. The Virginia furnace interest has closed a contract with a Virginia cast iron

Warehouse Prices, f.o.b. Philadelphia

Base per Lb.	
Plates, ¼-in. and heavier.	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes.	2.70c.
Soft steel bars, small shapes, iron bars (except bands).	2.80c.
Round-edge iron.	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel planished.	4.30c.
Reinforc. steel bars, sq., twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.50c.
Cold-fin. steel, sq. and flats.	4.00c.
Steel hoops.	3.55c.
Steel bands, No. 12 to ⅝-in. inclus.	3.30c.
Spring steel.	5.00c.
*Black sheets (No. 24).	3.80c.
†Galvanized sheets (No. 24).	4.45c.
Light plates, blue annealed (No. 10).	3.25c.
Blue ann'l'd sheets (No. 13).	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails.	3.20c.
Swedish iron bars.	6.60c.

*For 50 bundles or more: 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more: 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Plates.—Extreme concessions in prices of plates are less common than during a part of January, and mills are maintaining 1.90c. to 1.95c. a lb., Coatesville, Pa., or 2c. to 2.05c. per lb., delivered Philadelphia. A fair tonnage of small orders is being booked, so that most plate mills have a slightly better backlog of business. Some substantial orders are in prospect for the 30 ships, requiring upward of 125,000 tons of plates, bids on which will be opened Feb. 25 and 28 and March 3, but plate mills do not expect this tonnage to contribute to increased operations until well toward the end of the first half.

Sheets.—Producers are in most cases no longer facing an acute need for immediate specifications, but prices show no trend as yet toward strength. Blue annealed sheets are quoted at 2.25c. a lb., Pittsburgh, or 2.57c., delivered Philadelphia, for No. 13 gage and blue annealed plates at 2.10c., Pittsburgh, or 2.42c., delivered Philadelphia, for No. 10 gage. Concessions of \$1 and more a ton are still granted to preferred buyers. Black sheets range from 2.60c. to 2.65c. per lb., Pittsburgh, or 2.92c. to 2.97c., delivered Philadelphia. Sellers of high finished sheets have used 2.55c. a lb., Pittsburgh, as a base to which is added the usual extras for finish. Galvanized sheets are in moderately active demand and quoted at 3.30c. to 3.35c., Pittsburgh, or 3.62c. to 3.67c., delivered Philadelphia.

Warehouse Business.—Black and galvanized sheets out of stock have been reduced \$2 a ton on black to 3.80c. a lb., base, and \$4 a ton on galvanized to 4.45c., base. January business was larger than that of December, as a result of improved buying in the second half of the month.

Imports.—In the week ended Feb. 1,

6750 tons of iron ore arrived at this port from Algeria and 850 tons of chrome ore was received from Greece. Pig iron imports totaled 3295 tons, of which 2000 tons came from the United Kingdom and 1295 tons from British India. A shipment of 100 tons of spiegeleisen was received from the United Kingdom. Steel arrivals consisted of 51 tons of bearing steel and 11 tons of iron bars from Sweden and two tons of scrap from the United Kingdom.

Old Material.—Buying continues limited, except for the reported purchase of a small tonnage of No. 1 heavy melting steel by an eastern Pennsylvania plate mill at \$14.50 a ton, delivered. No. 2 heavy melting steel is inactive, but a fair tonnage is being shipped to the consumer at Bethlehem, Pa. Prices of all grades are unchanged.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel.	\$14.50
Scrap T rails.	14.00
No. 2 heavy melting steel.	\$12.00 to 12.50
No. 1 railroad wrought.	15.00 to 15.50
Bundled sheets (for steel works)	11.50
Hydraulic compressed, new	13.00
Hydraulic compressed, old.	12.00 to 12.50
Machine shop turnings (for steel works)	11.00
Heavy axle turnings (or equiv.)	12.50 to 13.00
Cast borings (for steel works and roll. mill)	11.00
Heavy breakable cast (for steel works)	13.50 to 14.00
Railroad grate bars.	11.00 to 11.50
Stove plate (for steel works)	11.00 to 11.50
No. 1 low phos., hvy., 0.04% and under.	20.50 to 21.50
Couplers and knuckles.	19.00 to 19.50
Rolled steel wheels.	19.00 to 19.50
No. 1 blast furnace scrap.	10.50 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	14.00
Shafting	19.00
Steel axles	20.00 to 21.00
No. 1 forge fire.	13.00 to 13.50
Cast iron carwheels.	15.00
No. 1 cast.	15.00 to 15.50
Cast borings (for chem. plant)	14.00 to 14.50
Steel rails for rolling.	15.00 to 15.50

35 steel frame stock cars and 25 steel frame flat cars, all 25 tons' capacity.

Bangor & Aroostook has placed 200 steel underframes and superstructures for box cars with Pressed Steel Car Co.

Pennsylvania has ordered five combination passenger and baggage cars from J. G. Brill Co.

American Refrigerator Co. will buy 1000 refrigerator cars.

Canton Tank Car Co. has placed 500 tank cars with American Car & Foundry Co. This is in addition to 500 cars recently purchased by the United Car & Equipment Co., an associated company.

The Van Sweringen interests are inquiring for 53 passenger coaches, 15 passenger-baggage cars, five passenger-baggage-mail cars, 12 express cars and six mail express cars for the Chesapeake & Ohio, Pere Marquette and Hocking Valley railroads.

Erie and Nickel Plate are expected to come into the market later for both freight and passenger cars.

Southern Pacific is in the market for 15 electric street cars.

Seaboard Air Line received bids Feb. 3 on 2000 box cars.

To Carry Cold-Rolled Strip in Stock

The American Steel & Wire Co. has made arrangements with Peter A. Frasse & Co. to carry stocks of cold-rolled strip steel to meet the calls of Eastern consumers who require immediate service. Frasse warehouses are located in Philadelphia, Buffalo, N. Y., and Hartford, Conn., as well as New York, and a new warehouse in Jersey City, N. J., will soon be completed.

Opens New York Office and Warehouse

The Billings & Spencer Co., Hartford, Conn., manufacturer of drop forged tools, drop forging machinery, contract forgings, golf clubs and hand wrought iron, has opened a New York office and warehouse at 53 Warren Street, in charge of W. Roy Moore as metropolitan sales manager. A complete stock of all of its products will be carried there. This organization will act also as sales representative of the Husky Corporation, Kenosha, Wis., with a complete line of sockets, extensions and kindred tools in that stock.

Railroad Equipment

C. & O. and Pere Marquette Buy 11,500 Freight Cars

ORDERS for 11,500 freight cars were placed today for the Chesapeake & Ohio, the Hocking Valley and the Pere Marquette. Distribution of the equipment has not yet been announced. Including this large purchase, orders for freight equipment totaled 12,817 cars. Inquiries for 91 passenger service cars have been put out for the same group of roads. The Seaboard Air Line has received bids on 2000 cars, including which a total of 6000 freight cars is now pending. Passenger cars now up for figures total 125.

Good-sized inquiries for both passenger and freight equipment for the other Van Sweringen roads, the Erie and the Nickel Plate, are now looked for.

Aluminum Co. of America is inquiring for 25 50-ton hopper cars.

Green Bay & Western is inquiring for 125 40-ton box cars.

Pennsylvania Tank Line has ordered

600 10,000-gal. tank cars from Petroleum Iron Works.

Union Gas & Electric Co., St. Louis, has ordered one 100-ton well car from St. Louis Car Co.

Anglo-Chilean Consolidated Nitrate Corporation has placed 210 flat cars with Magor Car Corporation.

Manila Railroad has ordered six 40-ton coal cars from American Car & Foundry Co.

International Railways of Central America are inquiring for 25 box cars,

By-product and Beehive Coke Production

	December, 1929	November, 1929	December, 1928
By-product coke production(a), net tons	4,180,601	4,321,494	4,316,891
do., 12 months	53,475,481(b)	.....	48,313,025
Beehive coke production(a), net tons	344,900	413,300	397,800
do., 12 months	6,015,000	.....	4,492,803
Total coke production(a), net tons	4,525,501	4,734,794	4,714,691
do., 12 months	59,490,481	.....	52,805,828
By-product coke made by furnace plants; per cent of total	75.0	76.8	78.1
do., 12 months	77.7	.....	79.1
By-product coke stocks, end of month:			
At furnace plants, net tons	1,050,269	999,961	725,439
At all plants	2,173,923	2,268,797	1,740,778

(a) United States Bureau of Mines.
(b) New high record.

Pacific Coast

Cast Iron Pipe and Reinforcing Steel Are Most Active Lines—Imports of Indian Iron

SAN FRANCISCO, Feb. 1 (*By Air Mail*).—Although construction work has been held up somewhat by winter weather, demand for iron and steel products on the Pacific Coast is growing and some fair sized tonnages were reported placed during the week. The cast iron pipe and reinforcing steel bar markets were the most active ones. The price structure is improving and in most lines quotations are fairly firm.

Pig Iron.—Foundry operations remain comparatively quiet and extensive operations are not looked for for some time to come. A shipment of 1000 tons of Indian iron has arrived. It is to be applied against contracts placed some time ago. Half of it will be reshipped to Los Angeles consumers. Another shipment of British Indian iron, about 1300 tons, is scheduled to arrive in port about Feb. 7. Half of this will be unloaded in Los Angeles. No change in prices has occurred.

Prices per gross ton at San Francisco:

*Utah basic	.....	\$25.00 to \$26.00
*Utah fdy., sil.	2.75 to	
3.25	.....	25.00 to 26.00
**Indian fdy., sil.	2.75 to	
3.25	.....	25.00 to 26.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Bars.—While a number of small bar projects were placed this week, only three of them called for lots of over 100 tons. Lynch-Cannon Co., Los Angeles, was awarded the general contract for the Salt River bridge near Phoenix, an unnamed interest securing the steel. W. S. Wetenhall Co., took 130 tons for a dyeing plant in San Francisco and an unnamed interest booked 254 tons for highway work in Imperial County, Cal. Bids have been opened on 3500 tons for the Fourth Street bridge at Los Angeles. Two highway projects in California, bids on which have just been opened, call for over 400 tons. Pending business totals over 5500 tons. Prices are fairly firm at 2.30c., base, on carload lots and at 2.60c. on smaller tonnages in the bay district. Los Angeles quotations are \$2 a ton higher. Merchant bar steel remains firm at 2.35c., c.i.f. Movement of this class of material is limited to small tonnages, usually less than carload lots.

Plates.—The Steel Tank & Pipe Co., Portland, secured the only large plate award of the week. This called for 282 tons of ¼ and 3/16-in. thickness and Nos. 10 and 12-gage blue annealed sheets for a riveted pipe line at Omak, Wash. No large pipe line inquiries

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.30c.
Soft steel bars	3.30c.
Small angles, ½-in. and over	3.15c.
Small angles, under ½-in.	3.55c.
Small channels and tees, ¼-in. to 2 ¼-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'd sheets (No. 10)	3.90c.
Galv. sheets (No. 24)	5.30c.
Struc. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	\$3.40
Cement c'd nails, 100 lb. keg	3.40

are now up for figures. Several of the oil companies have been placing orders for small tanks, the volume, however, being small. Prices are weak at 2.25c., c.i.f. Coast ports, and any desirable tonnage, it is believed, would probably bring out a quotation of \$2 a ton below this figure.

Shapes.—Demand is improving and total booked so far this year compares favorably with those for the same period last year. The Consolidated Steel Corporation took 1000 tons for an office building on South Spring Street, Los Angeles, and 184 tons for a pipe warehouse for Crane Co. in the same city. The Isaacson Iron Works secured 600 tons additional for a pulp plant at Port Angeles, Wash. The American River bridge at Sacramento has finally been placed with the Palm Iron Works. Moore Drydock Co. will erect 150 tons for a gantry crane for the Arden Salt Co. at Newark, Cal. Bids will shortly be taken on 1800 tons for the Meir & Frank store in Portland. It is reported that McClintic-Marshall Co. will secure 24,000 tons for the airport terminal in Los Angeles; this project must wait on new laws permitting the landing of planes in the city of Los Angeles. Prices are firm at 2.35c., c.i.f.

Cast Iron Pipe.—Some good sized

lots were placed this week. The United States Pipe & Foundry Co. took 3142 tons of 4 to 8-in. Class 250 pipe and 10 to 16-in. Class B pipe for the East Bay Municipal Utility District, Oakland, Cal. Santa Ana, Cal., placed 426 tons of 2 to 8-in. Class 150 pipe for the improvement of Villa Park with Lee R. Weber, Southgate, Cal. Alhambra, Cal., awarded the National Cast Iron Pipe Co. 1335 tons of 24-in. Class B and 18 and 20-in. Class 100 pipe, and the United States Pipe & Foundry Co. 134 tons of 4 to 12-in. Class 150 and 250 pipe. The American Cast Iron Pipe Co. was low bidder on 1693 tons of 2 to 10-in. Class B pipe for the Downey County Water Works District, Downey, Cal. Los Angeles opened bids this week on 635 tons of 6-in. Class 150 pipe. Colfax, Wash., will open bids on Feb. 3 for 196 tons of 6 to 10-in. Class B pipe. Bids were opened on 164 tons for a sewer project in Summerland Avenue, Southgate, Cal. On Feb. 17, San Diego will open bids on 189 tons of 2 to 8-in. Class C pipe for the improvement of Fifty-fourth Avenue.

Coke.—One importer has just brought in 6000 tons of English beehive and by-product coke. Of this total, 400 tons will be reshipped to Seattle and the rest will be distributed to Los Angeles and San Francisco consumers. Another shipment of 1500 tons is due in port on Feb. 10 and this material will be applied against contracts placed some time ago. A shipment of English coke involving over 7000 tons is scheduled to arrive on the Coast in April. Prices on English beehive coke continue unchanged at \$16 to \$17 a net ton, delivered incoming dock, while by-product coke ranges from \$12.50 to \$13 a net ton.

Birmingham

Pig Iron Shipments Exceed Production in January—Steel Backlogs Largest Since Early December

BIRMINGHAM, Feb. 4.—A slight excess of shipments over production during January has given the pig iron market a more cheerful tone. Recent gains in demand in this district have been reflected in the number of orders rather than the size of the tonnages booked. The larger foundries have been responsible for most of the increase in melt. Users have light stocks, which are in line with the prevailing policy of buying for early needs only. Those who placed contracts in late December for their first quarter requirements have been taking iron at a good rate. District sales continue to be made at \$15, base. Furnace operations are unchanged. Nine furnaces are producing foundry iron, six basic iron and one recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	\$14.50 to \$15.00
No. 1 fdy., 2.25 to 2.75 sil.	15.00 to 15.50
Basic	14.50 to 15.00

Finished Steel.—Recent gains in orders from the major consuming lines have brought backlogs to the highest point since early December. Current new business compares favorably with the volume at this time last year in several products, including plates, bars, shapes, railroad accessories and some of the lighter materials. In wire products the net gain in new business so far this year has been light. Inquiries for galvanized sheets indicate at least a normal demand by the time the spring buying period is under way. Upward of 3000 tons of rails has been placed with the Ensley mill by the Seaboard Air Line. Structural steel fabricators report a greater disposition on the part of the trade to close contracts that have been pending. The Virginia Bridge & Iron Co. has booked 1000 tons for a 16-story office building at Atlanta, 325 tons for the Gulf States Steel Co. plant at Alabama City and 250 tons for a court-

house at Jackson, Miss. New orders of the Nashville Bridge Co. include 625 tons for the Southern Phosphate Co., Bartow, Fla., 140 tons for a soaking pit for the Gulf States Steel Co. and 135 tons for the Alabama Union Building, Tuscaloosa. Other important tonnages are pending for this week. The Gulf States Steel Co. has taken off two open-hearths at Alabama City, leaving four active. The Tennessee company has seven active at Ensley and the same number in operation at Fairfield.

Cast Iron Pipe.—Bookings in the past 10 days have been below the average for the preceding weeks in January, though they included several attractive tonnages from distant points. Backlogs of pressure pipe manufacturers approximate those of this time last year. Utilities have bought most of the pipe sold so far this year, and all but a small percentage of the total sales are for delivery during the first quarter. Municipalities are showing more interest in their requirements for spring construction programs. Cities in the Southern territory are still withholding from the market projects that were planned last year. Shipments

are equal to the current production. Prices are unchanged and the tone is firm. The larger tonnages are taken at \$37 and the small lots at \$38 a net ton, Birmingham, for 6-in. and larger.

Coke.—The movement of foundry coke is hardly up to normal for this season, despite the recently increased consumption by some of the larger melters. The market remains at \$5, base, which has prevailed for the past two years.

Old Material.—Shipments of steel-making grades were off somewhat last week, as compared with the two preceding weeks. Demand is still lacking in cast grades. The feeling continues to prevail that important orders would drive prices below the current quotations.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$13.00 to \$13.50
Scrap steel rails.....	14.00
Short shoveling turnings.....	9.00
Cast iron borings.....	9.00
Stove plate.....	11.50 to 12.00
Steel axles.....	22.00
Iron axles.....	23.00
No. 1 railroad wrought.....	10.00 to 10.50
Rails for rolling.....	15.50
No. 1 cast.....	13.00
Tramcar wheels.....	12.50
Cast iron carwheels.....	13.00 to 13.50
Cast iron borings, chem.....	13.50 to 14.00

Cincinnati

Southern Pig Iron Weaker—A Leading Sheet Producer Has Three Weeks' Backlog—Scrap Dull

CINCINNATI, Feb. 4.—As district pig iron consumers are anticipating their requirements only for about 30 days, sales in the past week declined to about 4900 tons, as against 6000 tons in the previous week. Southern furnaces booked about 1200 tons of the total. Except for sales of 500 tons of Northern iron to a Dayton, Ohio, buyer and 200 tons to a Marion, Ohio, consumer, sales were in small lots. Last month Northern furnaces occasionally shaded \$18, base Lake furnace, on attractive lots, but they are holding to \$18 more rigidly on the small orders now being placed. Southern iron, however, is weaker. Some furnaces are quoting \$14 to \$14.50, Birmingham, for shipment to this district, but silicon differentials are sometimes being waived. The only sizable inquiry is for 200 to 400 tons of Northern foundry iron for a melter at Cambridge City, Ind.

Prices per gross ton, deliv'd Cincinnati:
So. Ohio fdy., sil. 1.75 to 2.25.....\$19.89 to \$20.39
Ala. fdy., sil. 1.75 to 2.25..... 17.69 to 18.19
Ala. fdy., sil. 2.25 to 2.75..... 18.19 to 18.69
Tenn. fdy., sil. 1.75 to 2.25..... 17.69 to 18.19
S't'n Ohio silvery, 8 per cent..... 26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Finished Material.—While the demand for sheets diminished last week, the heavy buying of the preceding two weeks has built up a backlog of about three weeks' production for district sheet mills. With automobile manufacturers and steel furniture manufac-

turers steadily increasing their specifications, the market appears to be gaining strength daily. While prices weakened somewhat during the heavy buying this month, it is believed that they have settled at the bottom and any revision will be upward. Accordingly, district manufacturers are not quoting the present prices for business beyond the first quarter. With operations on construction projects getting under way seriously, district fabricators report that demand for fabricated materials, particularly structural products, is increasing.

Coke.—No change is reported in coke specifications for this month, and present indications are that the steady

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.	
Plates and struc. shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
New billet reinforce. bars.....	3.15c.
Rail steel reinforce. bars.....	3.00c.
Hoops.....	4.05c.
Bands.....	3.50c.
Cold-fin. rounds and hex.....	3.85c.
Squares.....	4.35c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue ann'd sheets (No. 10).....	3.45c.
Structural rivets.....	4.20c.
Small rivets.....	60 per cent off list
No. 9 ann'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg.....	2.85
Cement c'd nails, base 100 lb. keg.....	2.85
Chain, per 100 lb.....	10.25
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.....	\$16.50
4-in.....	34.50
Seamless steel boiler tubes, 2-in.....	17.50
4-in.....	36.00

shipments of January will continue. Both by-product and beehive foundry coke are moving at a fair rate. Prices on by-product foundry coke will continue at about \$10.05, delivered Cincinnati, this month.

Old Material.—The scrap market is quiet and featureless. Mills are taking steel scrap on contract at a fair rate, but there is practically no movement in the cast iron grades. Bids on the Pennsylvania Railroad's list of about 41,000 tons will close this week.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$12.25 to \$12.75
Scrap rails for melting.....	13.00 to 13.50
Loose sheet clippings.....	8.00 to 8.50
Bundled sheets.....	10.75 to 11.25
Cast iron borings.....	8.50 to 9.00
Machine shop turnings.....	8.25 to 8.75
No. 1 busheling.....	10.00 to 10.50
No. 2 busheling.....	6.50 to 7.00
Rails for rolling.....	13.50 to 14.00
No. 1 locomotive tires.....	14.25 to 14.75
No. 2 railroad wrought.....	12.50 to 13.00
Short rails.....	17.50 to 18.00
Cast iron carwheels.....	12.00 to 12.50
No. 1 machinery cast.....	13.50 to 19.00
No. 1 railroad cast.....	15.00 to 15.50
Burnt cast.....	10.00 to 10.50
Stove plate.....	10.00 to 10.50
Brake shoes.....	10.00 to 10.50
Agricultural malleable.....	14.00 to 14.50
Railroad malleable.....	15.00 to 15.50

Canada

Good Outlook for Structural Steel—Pig Iron Firm

TORONTO, ONT., Feb. 4.—Despite predictions some two weeks ago of lower pig iron prices in the Toronto and Montreal districts, they have not occurred, and melters are beginning to come into the market more freely. Forward delivery business is still dull, but most melters are covered for requirements to the end of March and business beyond is not being closed. Releases against contract, however, are appearing regularly and large tonnages are going out on schedule. Spot buying is showing more improvement, with sales for the week reaching a high level for the year. A few orders for immediate delivery appeared lately in which there were lots up to as high as 500 tons. Inquiries indicate extensive spot business for some time to come. The daily melt is well sustained and in some instances is being increased. Importations of pig iron are at a comparatively low level, as agricultural implement plants are still operating on curtailed schedules. Pig iron prices are firm but unchanged.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$23.60
No. 2 fdy., sil. 1.75 to 2.25.....	23.10
Malleable.....	23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$25.00
No. 2 fdy., sil. 1.75 to 2.25.....	24.50
Malleable.....	25.00
Basic.....	23.50
Imported Iron, Montreal Warehouse	
Summerlee.....	\$33.50
Carron.....	33.00

Structural Steel.—While sales for the week were restricted to small tonnages, the general outlook for new business is bright. Several large building projects have been announced for which a total of upward of 25,000 tons of steel will be required in On-

tario and Quebec alone, while there is also a growing demand in most other provinces.

Old Material.—Improvement is reported in sales. Most consumers have been pegging along with small surplus stocks, but with the betterment in business generally, yard holdings are being added to and have resulted in a more active buying movement. Some price reductions have been made recently and this step also added to the interest in the market. Dealers' buying prices, quoted below, show a revision in practically all materials, and this action has also been taken in selling prices. Demand for steel scrap, however, is still backward, but more pronounced buying interest is manifest in the iron grades.

Dealers' buying prices:

	Per Gross Ton	Toronto	Montreal
Heavy melting steel.	\$9.00	\$8.00	
Rails, scrap.	11.00	9.00	
No. 1 wrought.	9.00	11.00	
Machine shop turnings.	7.00	6.00	
Boiler plate.	7.00	6.50	
Heavy axle turnings.	7.50	6.50	
Cast borings.	6.50	5.00	
Steel borings.	6.50	6.00	
Wrought pipe.	6.00	6.00	
Steel axles.	14.00	17.00	
Axles, wrought iron.	16.00	19.00	
No. 1 machinery cast.	11.00	16.00	
Stove plate.	14.00	12.00	
Standard carwheels.	14.00	14.50	
Malleable.	11.00	13.00	
	Per Net Ton		
No. 1 mach'y cast.	\$15.00	....
Stove plate.	11.00	....
Standard carwheels.	14.00	....
Malleable scrap.	11.00	....

Boston

Pig Iron Buying Light; Good Cast Pipe Demand

BOSTON, Feb. 4.—With the New England foundry industry operating at 40 to 45 per cent of capacity, buying of pig iron is light and did not aggregate 5000 tons in the past week. Sales included 1700 tons of Buffalo iron, 950 tons New York State, 750

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes.	3.265c.
Flats, hot-rolled.	4.15c.
Reinforcing bars.	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats.	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.	*3.55c. to 5.55c.
Squares and flats.	*4.05c. to 7.05c.
Toe calk steel.	6.00c.
Rivets, structural or boiler.	4.50c.
	Per Cent Off List
Machine bolts	.50 and 5
Carriage bolts	.50 and 5
Lag screws	.50 and 5
Hot-pressed nuts.	.50 and 5
Cold-punched nuts	.50 and 5
Stove bolts	.70 and 10

*Including quantity differentials.

tons of Mystic, and some Alabama and Indian iron. Buffalo No. 2 plain and No. 2X iron was sold at \$17 a ton, furnace, and No. 1X at \$17.50. Offers at \$16.50 a ton, base, Buffalo, are said to have been turned down by the furnaces. Furnaces east of Buffalo are doing less than the equivalent of \$17 a ton, Buffalo furnace. The General Fire Extinguisher Co., Providence, R. I., probably will close this week on 650 tons of No. 2X and 350 tons of No. 1X for late February and March delivery. No other inquiries for round tonnages are in sellers' hands.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil.	1.75 to 2.25..	\$21.91 to \$22.41
*Buffalo, sil.	2.25 to 2.75..	21.91 to 22.41
East Penn., sil.	1.75 to 2.25	22.65 to 23.15
East Penn., sil.	2.25 to 2.75	23.15 to 23.65
Va., sil.	1.75 to 2.25.....	25.21
Va., sil.	2.25 to 2.75.....	25.71
*Ala., sil.	1.75 to 2.25.....	24.11
*Ala., sil.	2.25 to 2.75.....	24.61
†Ala., sil.	1.75 to 2.25.....	20.25
†Ala., sil.	2.25 to 2.75.....	20.75

Freight rates: \$4.91 all rail from Buffalo; \$3.65 all rail from eastern Pennsylvania; \$5.21 all rail from Virginia; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

*All rail rate.
†Rail and water rate.

Reinforcing Steel.—Mumirch Brothers, St. Louis, were the low bidders on 500 tons of billet reinforcing steel bars required for a hospital at Newington, Conn. Otherwise, lettings the past week did not exceed 200 tons. Prospects are increasing and include a local bank, telephone building and two power houses, requiring approximately 1000 tons, and electric lighting units in various sections of New England. Prices from stock: 1 to 5 ton lots, 3.16½c. to 3.26½c. a lb., f.o.b. metropolitan Boston; 5 to 99 ton lots, 2.86½c.; 100-ton and larger lots, 2.76½c. The market for rail steel bars continues quiet at 2.26½c., base, delivered Boston freight rate points.

Cast Iron Pipe.—A utility company has purchased six months' pipe requirements, a large tonnage being involved, and private business continues good. Boston has not placed its order for 2100 tons of pipe, bids for which closed Jan. 27. Quincy, Mass., has closed bids on 350 tons of 6 to 12-in. pipe; Attleboro, Mass., closes bids Feb. 7 on 100 tons of 8 and 10-in.; and Taunton, Mass., Feb. 11 on 500 tons of 8 to 12-in. Melrose, Beverly and Waltham, Mass., will later buy pipe for extension work. Prices quoted openly on domestic pipe are: 4-in., \$47.10 to \$48.10 a ton, delivered common Boston freight rate points; 6 to 12-in., \$42.10 to \$43.10; larger dimensions, \$41.10 to \$42.10. A \$4 differential is asked on Class A and gas pipe.

Old Material.—New orders are slow in developing, consequently current buying is largely on old contracts. Purchases of single cars of No. 1 heavy melting steel are at or close to \$10.80 a ton, on cars shipping point, and of 200-ton lots and larger at \$10.50 to \$10.75. A Worcester, Mass., mill is still buying bundled skeleton at \$10.75 a ton, delivered. DuPont interests have resumed taking of

chemical borings, and the market for them is firmer. The best price offered for steel axles is \$15 a ton, delivered, from a Portland, Me., roller, but brokers will not sell at that figure. Buffalo consumers are buying stove plate, for which brokers are paying \$6.60 to \$6.75 a ton, on cars shipping point. Textile machinery cast has declined 50c. a ton due to a lack of demand, but the market for machinery cast holds well. Specially selected No. 1 machinery cast was sold recently as high as \$16 a ton, delivered. A steamer will start loading 3800 tons of scrap here this week for Danzig.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.	\$10.50 to \$11.00
Scrap T rails.	10.25 to 10.50
Scrap girder rails.	9.00 to 9.50
No. 1 railroad wrought.	10.50 to 11.00
No. 1 yard wrought.	9.50 to 10.00
Machine shop turnings.	6.10 to 6.60
Cast iron borings (steel works and rolling mill).	6.25 to 6.75
Bundled skeleton, long.	8.50 to 9.00
Forge flashings.	9.00 to 9.30
Blast furnace borings and turnings.	6.00 to 6.25
Forge scrap.	8.25 to 8.75
Shafting.	14.00 to 14.50
Steel car axles.	15.50 to 16.50
Wrought pipe 1 in. in diameter (over 2 ft. long).	9.00 to 9.50
Rails for rolling.	10.50 to 11.00
Cast iron borings, chemical.	9.00 to 9.50

Prices per gross ton deliv'd consumers' yards:

Textile cast	\$13.50 to \$14.00
No. 1 machinery cast.	15.00 to 15.25
No. 2 machinery cast.	14.00 to 14.50
Stove plate	10.50 to 11.00
Railroad malleable	17.00 to 17.50

Buffalo

Pig Iron Melt Gains; Steel Operations Up

BUFFALO, Feb. 4.—There has been an increase in the melt and more interest in the buying of pig iron. One local producer has booked between 2000 to 3000 tons during the past week. Two others report sales of about 1000 tons each. Inquiries total 2500 to 3000 tons, including one of 800 tons of foundry put out by the General Electric Co. for Buffalo and one of 500 tons of foundry from a heating concern. The district buying price is on a base of \$18.50. On Eastern business some producers are asking \$17, but there have been some concessions from this figure. Most of the inquiries are for prompt shipment. Producers have not booked any iron for the second quarter, but indications are that they would be willing to do so at the current market price. Shipments have been satisfactory.

Prices per gross ton f.o.b. furnace:

No. 2 fdy., sil.	1.75 to 2.25.....	\$18.50
No. 2X fdy., sil.	2.25 to 2.75.....	19.00
No. 1 fdy., sil.	2.75 to 3.25.....	20.00
Malleable, sil. up to 2.25.		19.00
Basic		17.00
Lake Superior charcoal.		27.28

Finished Steel.—Somewhat better steel mill operations prevail. The Lackawanna plant of the Bethlehem Steel Co. has increased its operation to 16 open-hearth, with all the mills on single turn and the roughing mills on double turn. The Seneca Iron & Steel Co. shows a 70 to 72 per cent operation. The Wickwire-Spencer

Warehouse Prices, f.o.b. Buffalo

Base per Lb.

Plates and struc. shapes.....	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex.....	4.45c.
Rounds	3.95c.
Cold-rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.20c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'd sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$3.35
Black wire, base per 100 lb.....	3.45

Steel Co. is at 66 per cent, and the Donner Steel Co. has added one open-hearth, making four active, with a possibility that a fifth will be added this week. The demand for sheets has received an impetus, with automobile orders coming out a little stronger and the metal furniture industry showing an improvement. Reinforcing bars show little activity, with the exception of 2000 tons for a bridge at Rochester, which has not yet been let.

Old Material.—A slightly better feeling exists, but no outstanding sales are reported. It is probable that one large interest here would be willing to buy No. 1 heavy melting steel at \$14 and No. 2 heavy melting steel at \$12.50, but the market is sufficiently strong to make the dealers disinclined to accept the business at these prices. Dealers are offering \$15, Weirton, W. Va., for No. 2 steel and \$16, Weirton and Pittsburgh points, for hydraulic compressed sheets.

Prices per gross ton f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:

No. 1 heavy melting steel.....	\$14.00 to \$14.50
No. 2 heavy melting scrap.....	12.50
Scrap rails	14.50
Hydraul. comp. sheets.....	12.50
Hand bundled sheets.....	10.50 to 11.00
Drop forge flashings.....	12.50
No. 1 busheling	13.50
Hvy. steel axle turnings.....	13.50 to 14.00
Machine shop turnings.....	9.50 to 10.00
No. 1 railroad wrought.....	11.00 to 11.50

Acid Open-Hearth Grades:

Knuckles and couplers.....	18.00 to 18.50
Coll and leaf springs.....	18.00 to 18.50
Roller steel wheels	18.00 to 18.50
Low phos. billet and bloom ends	18.00 to 18.50

Electric Furnace Grades:

Short shov. steel turnings.....	12.50 to 13.00
---------------------------------	----------------

Blast Furnace Grades:

Short mixed borings and turnings	10.75 to 11.25
Cast iron borings	10.75 to 11.25
No. 2 busheling	8.00

Rolling Mill Grades:

Steel car axles	17.00 to 17.50
Iron axles	20.00 to 21.00

Cupola Grades:

No. 1 machinery cast.....	14.50 to 15.00
Stove plate	12.50 to 12.75
Locomotive grate bars.....	10.50 to 11.00
Steel rails, 3 ft. and under	18.00 to 18.50
Cast iron carwheels.....	12.00 to 12.50

Malleable Grades:

Industrial	16.50 to 17.00
Railroad	16.50 to 17.00
Agricultural	16.50 to 17.00

Special Grades:

Chemical borings	12.00 to 12.50
------------------------	----------------

On Jan. 15 the Union Steel Co., First National Bank Building, Youngstown, Ohio, John M. Watson, Jr., manager, discontinued the district sales for the Canonsburg Steel & Iron Works and became district sales agent for the Superior Sheet Steel Co., Canton, Ohio, a division of the Continental Steel Corporation, Kokomo, Ind.

Detroit

Ford Schedule of 8000 Cars Daily Not Yet Reached— Past Week's Top Was 6000 Units

DETROIT, Feb. 4.—The Ford Motor Co. has not succeeded in reaching a schedule of 8000 cars a day, which it was reported a week ago was its immediate aim. Output during the past week did not get above 6000 cars daily, and this is the schedule for the current week.

It is stated here that the Ford plant arranged a definite schedule of 8000 cars a day, but could not step up its production as rapidly as expected.

Scrap prices are unchanged this week.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	\$12.50 to \$13.00
Borings and short turnings	9.25 to 9.75
Long turnings	8.50 to 9.00
No. 1 machinery cast.....	12.50 to 13.00
Automotive cast	11.50 to 12.00
Hydraul. comp. sheets.....	12.50 to 13.00
Stove plate	9.00 to 9.50
New No. 1 busheling.....	11.50 to 12.00
Old No. 1 busheling.....	9.25
Sheet clippings	8.00 to 8.50
Flashings	10.75 to 11.25

St. Louis

Aggressive Selling of Southern Iron—Scrap Dull, With Both Buyers and Dealers Conservative

ST. LOUIS, Feb. 4.—Makers of Southern pig iron have resumed an aggressive selling campaign, similar to the one conducted with considerable success last fall, and it is understood that heavy tonnages have been disposed of in this territory. As was the case last fall, price has been a factor in the movement of this iron by Southern furnaces, and it is stated that sales have been made at prices ranging from \$13 to \$13.50, Birmingham. The activity of the Southern makers has cut heavily into the business of the Northern producers. While the prices quoted were for first quarter delivery, it is stated that in some instances such heavy tonnages were sold as to make necessary shipping some of the iron during the second quarter. The St. Louis Gas & Coke Corporation sold about 4800 tons of both foundry and malleable grades. The local maker has made no change in its prices. The melt is increasing among plants catering to the implement trade, and some interest is being shown by

stove manufacturers, who are specializing now in gas-burning grates. The automobile trade also is showing some slight improvement.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	\$19.50 to \$20.00
Malleable, f.o.b. Granite City	20.00
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	17.42 to 18.42
Northern malleable, deliv'd	22.16
Northern basic, deliv'd....	22.16

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Finished Steel.—The only new business worth recording is the purchase of 900,000 tie plates by the Wabash Railway, which divided the order among six mills. Specifications against contracts and new business in plates, shapes and bars are said to be improving. The trade in galvanized sheets is marked by price cutting. January warehouse business is about on a par with the first month of last year, but slightly better than December. All lines are sharing in this business except structural shapes, which are said to be dull. Business with structural fabricators continues quiet.

Old Materials.—Dealers report business quiet. Consumers are extremely conservative, as are dealers, who generally are reluctant to accept business on the present basis of prices. With a moderation in weather, there has been a freer movement of scrap from country dealers, but railroad shipments against contracts still are slow. Heavy turnings are off 50c. a ton, while both steel and iron car axles are up 50c. Railroad lists include: Pennsylvania, 41,260 tons; Baltimore & Ohio, 13,480 tons; St. Louis & Hannibal, 1567 tons; Chicago, Indianapolis & Louisville, 985 tons; Missouri-Kansas-Texas, 345 tons; Missouri Pacific,

Warehouse Prices, f.o.b. St. Louis

Base per Lb.

Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24).....	4.25c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'd sheet (No. 10).....	3.45c.
Black corrug. sheets (No. 24).....	4.30c.
Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.15c.

Per Cent Off List

Tank rivets, $\frac{7}{8}$ -in. and smaller, 100 lb. or more	65
Less than 100 lb.....	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.....	50

129 carloads, and Chicago, Milwaukee, St. Paul & Pacific, 120 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel.....	\$12.50 to \$13.00
No. 2 heavy melting or shoveling steel.....	11.75 to 12.25
No. 1 locomotive tires....	14.50 to 15.00
Misc. stand.-sec. rails including frogs, switches and guards, cut apart....	13.50 to 14.00
Railroad springs.....	15.50 to 16.00
Bundled sheets.....	9.50 to 10.00
No. 2 railroad wrought....	12.50 to 13.00
No. 1 bushing.....	9.75 to 10.25
Cast iron borings and shoveling turnings.....	9.25 to 9.75
Iron rails.....	13.00 to 13.50
Rolls for rolling.....	14.50 to 15.00
Machine shop turnings....	6.75 to 7.25
Heavy turnings.....	9.00 to 9.50
Steel car axles.....	19.50 to 20.00
Iron car axles.....	26.00 to 26.50
Wrot. iron bars and trans.	21.50 to 22.00
No. 1 railroad wrought....	13.00 to 13.50
Steel rails, less than 3 ft..	17.00 to 17.50
Steel angle bars.....	14.00 to 14.50
Cast iron carwheels.....	14.00 to 14.50
No. 1 machinery cast.....	15.25 to 15.75
Railroad malleable.....	14.00 to 14.50
No. 1 railroad cast.....	14.00 to 14.50
Stove plate.....	11.75 to 12.25
Relay. rails 60 lb. and under.....	20.50 to 23.50
Relay. rails 70 lb. and over.....	26.50 to 29.00
Agricult. malleable.....	13.00 to 13.50

Russian Steel Output Falls Short of Demand

HAMBURG, GERMANY, Jan. 14.—During the first two months of the business year beginning Oct. 1, the machinery industry of the U. S. S. R. produced only 80 per cent of its allotment under the five-year plan. The heavy hardware industry also fell behind its quota. Their failure is attributed to an inadequate supply of semi-finished and finished steel products. The claim is made by the South Russian Machinery Trust that the quality of steel produced by the South Russian Steel Trust is such as to necessitate rejection of about 20 per cent of its output as suitable only for scrap.

New Non-Magnetic Steel

A. Milne & Co., iron and steel importers, 745 Washington Street, New York, have placed on the market a new type of non-magnetic steel known as Swedelec. This combines high permeability with low hysteresis loss. The product should be of special interest to manufacturers of electrical relay coils, railroad signals, telephone switchboard equipment, radio loud speakers and transformers, X-ray machines, X-ray apparatus and similar articles. Charts and pamphlets are available.

Reprint of the A.S.M.E. technical committee annual reports on research, standardization, power test codes, boiler codes and safety have been made in a pocket-size pamphlet of 48 pages, which tells of the work of the various committees during the year and outlines projects under way in carrying forward the work of each of the committees.

Machinery Federation Proposed

(Concluded from page 455)

lishment of normal depreciation rates and the 13-month calendar.

E. P. Essley, of the E. L. Essley Machinery Co., Chicago, explained the plan of the Chicago machine tool dealers in handling the trading in of used machine tools. Under this plan an offer to buy old tools becomes registered at a central office and the best price is made known to all who are interested. The plan virtually amounts to an open auction, and has resulted, Mr. Essley said, in greatly simplifying the trade-in situation.

W. H. Rastall, chief of the machinery division, Bureau of Foreign and Domestic Commerce, advocated a publicity campaign to show manufacturers the losses that result from continued use of obsolete equipment.

Time Sales Practices Differ

The discussion of time sales developed that practices in various machinery industries differ widely. It was said that not over 5 per cent of the machine tools marketed in the United States are sold on time payments, but other lines of industrial machinery are to a large extent sold on installment basis. Most of the industries, it was revealed, try to confine these payments to one year, but in some instances they are extended to two years, or even three years. It was said that when payments are required within one year the installment plan works out fairly well, but, when a buyer takes two or three years, collections are likely to slow up during the latter part of the period. In other words, the longer the term, the harder it is to collect.

The discussion on uniform cost of accounting showed that progress is being made in individual industries, but doubt was expressed that the methods employed by one group of machinery builders could be successfully applied to another group until there is more general agreement on what elements should go into the cost item. Considerable progress in this work has been made by the National Machine Tool Builders' Association, which will publish in the fall a cost manual. Copies of this manual will be available to other machinery groups so that they may pattern their cost methods after the plan of the machine tool builders, if they so desire.

Statistical Work of Primary Importance

It was generally agreed among the association representatives that the gathering of statistics for each industry is one of the most important functions of a trade association. E. F. DuBrul, manager of the National Machine Tool Builders' Association, which has gathered statistics for 11 years, said that the statistics of the industry should include orders received, unfilled orders on hand, shipments and cancellations. He regards

orders as the most important item, shipments coming next, and production of perhaps least importance as an indicator for the future.

The discussion on establishment of normal rates of depreciation was followed by appointment of a special committee, which met the following day with representatives of the Bureau of Internal Revenue.

On the subject of firm bidding, a letter was received from W. W. Nichols, of the Machinery Builders' Society, outlining a program which this organization is sponsoring to encourage all manufacturers of machinery to make their first price the final price. The Machinery Builders' Society has prepared a placard which it will ask purchasing agents to hang in their offices urging "final prices first" to the end that the evil of revising prices after they have once been submitted may be mitigated.

There was no discussion regarding the 13-month calendar beyond the report that companies which are using it in their accounting departments have found that it works very successfully.

The next meeting of the machinery conference will be called by Chairman E. F. DuBrul and will be held about three months hence, at which time a report will be expected from the committee to consider the matter of the organization of a machinery federation.

Chromium Consumption Gains Rapidly

Rapid expansion in the consumption of chromium, begun in 1922, has continued in recent years, and present indications are for further increase in consumption, says Lewis A. Smith, in a review of the situation just made public by the United States Bureau of Mines, Department of Commerce. The most noteworthy recent developments include the extensive adoption of chromium plating, especially for automobile parts; the increased utilization of rustless iron and steel and nickel-chromium steel; and the further substitution of chromite refractories for magnesite refractories, due to a favorable price differential. The tanning industry appears to be turning more and more toward chromium reagents. The demand for chromium pigments seems to have been maintained.

"Automatic Metallographic Polishing Machine" is the title of a reprint from the *Journal of Research* of the United States Bureau of Standards which embraces Research Paper No. 117 by S. Epstein, associate metallurgist, and John P. Buckley, mechanical draftsman of the Bureau.

Non-Ferrous Metal Markets

Copper Demand Improves— Tin Dull—Lead Unchanged —Zinc Quiet and Steady

NEW YORK, Feb. 4.

Copper.—Buying both here and abroad has improved in the last week, but is still of a hand-to-mouth character. Sentiment is better and fundamental conditions have improved. Fabricators here report some increase in orders. Figures given out by two of the leading copper producers indicate that their business in January was about 80 per cent of the monthly average for 1929. The statement is also published that bookings of Copper Exporters, Inc., for foreign shipment, totaling about 35,000 tons in January, were about 75 per cent of the 1929 monthly average. On top of this comes the announcement that a large producer will curtail its mine production 40 per cent beginning Feb. 9. Indications therefore point to an increase in the potential demand for copper and to a sizable decrease in production, which, however, will not be fully apparent for a month or two at least. Consumers here and abroad have covered only a small part of their February requirements and such business as is booked is for prompt shipment in nearly every case. The price situation continues very firm, with no indication of any change. Electrolytic copper is quoted at 18c., delivered in the Connecticut Valley, and the price of Copper Exporters, Inc., is still 18.30c. c.i.f., usual European ports. Demand for Lake copper is fair with quotations unchanged at 18c. to 18.12½c., delivered.

Copper Averages.—The average price of Lake copper for January, based on daily quotations in THE IRON AGE, was 18.12½c., delivered New York. The price of electrolytic copper was 17.75c., refinery, or 18c., delivered in the Connecticut Valley.

Tin.—For another week the market has been exceedingly dull and sales of spot Straits tin have been small. American buyers, who purchased quite heavily two or three weeks ago when prices fell, are taking no interest at the recent higher levels. They are either sufficiently well covered or feel that they are safe in refraining from entering the market until lower prices again prevail. Statistics for January showed an increase in the world's visible supply of only 892 tons, though a larger increase was expected earlier in the month. American deliveries were also small. In an exceedingly dull market here to-

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Feb. 4	Feb. 3	Feb. 1	Jan. 31	Jan. 30	Jan. 29
Lake copper, New York.....	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*.....	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	39.12½	39.00	....	39.00	39.37½	39.75
Zinc, East St. Louis.....	5.25	5.25	5.25	5.25	5.25	5.25
Zinc, New York.....	5.60	5.60	5.60	5.60	5.60	5.60
Lead, St. Louis.....	6.10	6.10	6.10	6.10	6.10	6.10
Lead, New York.....	6.25	6.25	6.25	6.25	6.25	6.25

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	23.25c.
Copper, hot rolled	26.75c.
Zinc	10.50c.
Lead (full sheets)	10.00c.
Seamless Tubes—	
High brass	28.25c.
Copper	29.25c.
Rods—	
High brass	21.25c.
Naval brass.....	24.00c.
Wire—	
Copper	19.87½c.
High brass	23.75c.
Copper in Rolls	26.75c.
Brased Brass Tubing.....	30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—		Base per Lb.
High brass	23.25c.	
Copper, hot rolled.....	27.75c.	
Copper, cold rolled, 14 oz. and heavier	30.00c.	
Zinc	10.75c.	
Lead, wide	10.30c.	
Seamless Tubes—		
Brass	28.25c.	
Copper	29.25c.	
Brass Rods.....	21.25c.	
Brased Brass Tubes.....	31.00c.	

New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass.....	21.12½c. to 22.12½c.
Copper, hot rolled, base sizes.....	27.75c. to 28.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes.....	30.00c. to 31.00c.
Seamless Tubes—	
Brass	26.00c. to 27.00c.
Copper	29.12½c. to 30.12½c.
Brass Rods	18.87½c. to 19.87½c.
Brased Brass Tubes	29.12½c. to 30.12½c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	10.75c. to 11.25c.
Zinc sheets, open.....	11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	40.00c. to 41.00c.
Tin, bar.....	42.00c. to 43.00c.
Copper, Lake.....	19.50c.
Copper, electrolytic.....	19.25c.
Copper, casting	19.00c.
Zinc, slab.....	6.50c. to 7.50c.
Lead, American pig.....	7.00c. to 7.50c.
Lead, bar	9.00c. to 9.50c.
Antimony, Asiatic.....	10.50c. to 11.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure).....	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½.....	26.75c. to 27.75c.

Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig.....	44.25c.
Tin, bar	46.25c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab.....	7.75c. to 8.00c.
Lead, American pig.....	7.00c. to 7.20c.
Lead, bar.....	9.25c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade.....	18.00c.
Babbitt metal, high grade.....	47.25c.
Solder, ½ and ½.....	28.50c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.	14.75c.	16.25c.
Copper, hvy. and wire	14.50c.	16.00c.
Copper, light and bottoms	12.50c.	13.75c.
Brass, heavy	8.00c.	9.25c.
Brass, light	6.75c.	7.75c.
Hvy. machine composition	11.25c.	12.25c.
No. 1 yel. brass turnings	9.00c.	9.50c.
No. 1 red brass or compos. turnings..	10.50c.	11.75c.
Lead, heavy	4.75c.	5.25c.
Lead, tea	3.75c.	4.25c.
Zinc	2.75c.	3.25c.
Sheet aluminum.....	11.00c.	13.00c.
Cast aluminum.....	10.00c.	12.00c.

day spot Straits tin was quoted at 39.12½c., New York. Prices in London were hardly changed from those of a week ago, with spot standard quoted at £176 15s., future standard at £179 15s. and spot Straits at £178 10s. The Singapore price was £180 10s.

Lead.—Demand for lead is mostly for February, with sales moderate. There is some inquiry for March, but not much has been booked for that position. Some buyers would even like contracts for April and May, but they are unable to obtain them. While considerable February metal has been sold, it is believed that much is still to be bought. Prices are firm and unchanged at 6.10c., St. Louis, in the outside market. The quotation of the leading interest is still 6.25c., New York, as the contract price.

Zinc.—As a result of heavy buying during January the market has turned exceedingly quiet. There is almost no inquiry and prices are largely nominal, the quotation for prime Western zinc having settled at 5.25c., East St. Louis, or 5.60c., New York. There was a flurry in the ore market last week, with sales made at \$37, Joplin, an advance of \$2 per ton. There is some doubt whether this price has been firmly established or whether some ore is still available at \$35. About 5570 tons was sold last week, which was more than the output, estimated at only 5000 tons. Shipments were nearly 6700 tons, reducing the

surplus to about 28,800 tons. Output is expected to be higher this week.

Antimony.—This market has turned very quiet, but prices are firm and very little changed from those of a week ago. Chinese metal for spot delivery is obtainable at 8.75c. to 8.87½c., New York, duty paid, and futures are quoted at 8.12½c.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. a lb., with shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable at 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago.

CHICAGO, Feb. 4.—Prices, with the exception of antimony, are at the levels of last week. Quotations on tin rose early in the week but later dropped back to the old price. Demand is somewhat improved from the viewpoint of tonnage but it is spotty. The old metal market is steady with demand slightly improved.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 39.37½c.; lead, 6.20c.; zinc, 5.25c.; in less-than-carload lots, antimony, 9.75c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3c.; pewter, No. 1, 24.50c.; tin foil, 22c.; block tin, 32c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

Merger of Blower Manufacturers

Several makers of blowers, including the P. H. & F. M. Roots Co., original patentee and for 70 years manufacturer of rotary positive blowers, pumps and meters, have been merged and are now under the control of the Stacey Engineering Co., Columbus, Ohio. The new organization includes also the Connersville Blower Co., Connersville, Ind., Wilbraham-Green Blower Co., Pottstown, Pa., and Stacey Brothers Gas Construction Co., Cincinnati.

Col. Carmi A. Thompson, Cleveland, was elected president; Corwin Abbott, vice-president and general manager; Fletcher S. Heath, Columbus, vice-

president; and Erle G. Meeks, secretary and treasurer. Charles T. Gordon will continue as general superintendent.

The new board of directors consists of Colonel Thompson, F. S. Heath and C. A. Ward, Columbus, W. B. Stacey, Cincinnati, J. T. Wilkin, Corwin Abbott and Charles T. Gordon, Connersville. E. D. Johnston, who for the past 45 years has been connected with the P. H. & F. M. Roots Co., has resigned as president of the company and has retired from active business.

All companies in the merger will maintain their separate identities and organizations, and will continue to operate separately until the final plans of the consolidation can be consummated.

McWane Cast Iron Pipe Co. Acquires Utah Plant

The McWane Cast Iron Pipe Co., Birmingham, which, with the Columbia Steel Corporation of California, owned jointly the Pacific States Cast Iron Pipe Co., Provo, Utah, has purchased the remainder of the stock from the United States Steel Corporation, which recently acquired ownership of the Columbia Steel Corporation. The Provo plant has an annual capacity of 25,000 tons.

Prices on Cap Screws Are Revised

Prices on cap screws with hexagon heads, both U.S.S. and S.A.E. thread, have been revised in new price lists and new discount schedules that became effective Jan. 23. List prices on hexagon head cap screws 3/8-in. in diameter and less are reduced for short lengths, but on 7/16-in. diameters and larger they are higher for all lengths. Net prices, because of a new discount of 85 and 10 per cent off list, are lower for all screws 3/8-in. in diameter and smaller, and higher for screws 7/16-in. in diameter and larger. No change has been made in the list or discount on cap screws in other styles or set screws, studs or nuts.

Non-Ferrous Ingot Meeting

WASHINGTON, Feb. 4.—G. S. Ferguson, Jr., chairman of the Federal Trade Commission, will preside at a trade practice conference of the non-ferrous ingot industry to be held here Thursday of the current week at the Chamber of Commerce of the United States.

Enlarging Coke Plant

The Weirton Steel Co., Weirton, W. Va., subsidiary of the National Steel Corporation, Pittsburgh, is enlarging its by-products coke plant. Additions to the plant now under way will increase the by-product plant capacity by 150,000 tons annually.

Austin Co., Cleveland, has opened a branch office at 326 Frelinghuysen Avenue, Newark, N. J. This will augment the company's Eastern district headquarters at 120 Broadway, New York. The branch office will have complete construction facilities. It will be in charge of J. K. Gannett, the company's regional vice-president of its Eastern district.

Federal Steel Corporation, 126 South Artillery Avenue, Detroit, Mich., has added a department for the handling of a complete line of steel products in addition to sheet steel in which the company heretofore has specialized. The new department will also deal in surplus and obsolete materials. It will be under the supervision of Arthur L. Tushbant.

Iron and Steel Production of Canada, 1929 and 1928

	December, 1929	November, 1929	December, 1928
Pig iron(a), gross tons.....	82,632	86,516	103,450
do., 12 months.....	1,090,244(b)	.....	1,037,535
Ferroalloys.....	6,986	7,418	.....
do., 12 months.....	80,010	.....	45,233
Steel ingots.....	76,389	89,135	103,054(c)
do., 12 months.....	1,309,543	.....	1,196,781
Steel castings.....	6,026	4,513	.....
do., 12 months.....	70,145	.....	43,432
Total steel.....	82,415	93,648	103,054
do., 12 months.....	1,379,688	.....	1,240,214

(a) Dominion Bureau of Statistics, Ottawa.

(b) New high record, displacing the 1918 record of 1,067,456 tons.

(c) Includes castings.

Improvement of Mahoning and Shenango Urged

Waterways improvement from Beaver, Pa., on the Ohio River, to Warren, Ohio, on the Mahoning River and to Greenville, Pa., on the Shenango River is urged by the Beaver, Mahoning and Shenango Rivers Improvement Association, of which T. J. Bray, Stambaugh Building, Youngstown, Ohio, is president.

This project is distinct from the proposal to construct a barge canal from the Beaver to the Ashtabula rivers, but, if carried out, would mean the completion of half of the larger undertaking.

An examination and survey of the stream channels that the association wants improved is authorized in a bill introduced in Congress, sponsored in the Senate by Senator David A. Reed of Pennsylvania, and in the House of Representatives by Hon. J. Howard Swick of Beaver Falls, Pa. If the project receives the approval of the Board of Army Engineers and of Congress, one of the three leading steel-making districts will be placed more nearly on a parity with other iron and steel centers, declares Mr. Bray. The Mahoning and Shenango Valley territory, according to Mr. Bray, is, broadly speaking, the only large northern district that does not have the benefit of water transportation on any of the raw materials entering the making of pig iron.

Pension Distribution Totals Four Millions

The nineteenth annual report of the United States Steel and Carnegie Pension Fund shows that \$3,940,678.15 was distributed as pensions among retired employees of the United States Steel Corporation and its subsidiary companies in 1929. The Carnegie Steel Co. was first among the subsidiaries in the amount paid to retired employees, the sum being \$964,086.98. Some of the larger subsidiary company pension disbursements were: American Steel & Wire Co., \$704,484.37; American Sheet & Tin Plate Co., \$494,711.20; National Tube Co., \$471,982.43; H. C. Frick Coke Co., \$343,414.40; Illinois Steel Co., \$207,570.63; American Bridge Co., \$182,753.03; Oliver Iron Mining Co., \$159,859.90; Tennessee Coal, Iron & Rail-

road Co., \$60,307.75 and Lorain Steel Co., \$30,696.25.

Employees added to the pension roll during 1929 totaled 1007 and 587 were removed from the list. At the close of the year 7420 were on the pension roll. The average age of the 12,524 employees retired from 1911 to 1929, inclusive, was 63.57 years; their average period of service was 31.26 years, and the average monthly pension, \$38.75. The total amount paid in pensions since the inauguration of the pension plan on Jan. 1, 1911, was \$26,266,100.82.

Beneficiaries of the pension fund make no contributions to it, the income of the latter being derived from a fund created jointly by Andrew Carnegie and the United States Steel Corporation. The latter provides also whatever additional moneys may be required in the administration of the pension plan.

The pension fund applies to all employees of the United States Steel Corporation and its subsidiary companies, numbering approximately 250,000.

Edward N. Hurley Heads Export Association

Edward N. Hurley, wartime chairman of the United States Shipping Board, was elected president of the American Manufacturers' Export Association at a meeting of the board of directors in New York, Jan. 27. He succeeds Thomas J. Watson, president, International Business Machines Corporation. In accepting the presidency of the association, Mr. Hurley stressed the importance of exports as a factor in world prosperity.

"American industrialists," he said, "while recognizing the predominant importance of the domestic market, now appreciate the fact that a reasonable proportion of exports is not only good business in itself, but is an invaluable factor in securing continued and balanced production."

The board of directors of the American Manufacturers' Export Association includes James A. Farrell, president, United States Steel Corporation; Thomas J. Watson, president, International Business Machines Corporation; Walter C. Teagle, president, Standard Oil Co. of New Jersey, and Cornelius F. Kelly, president, Anaconda Copper Mining Co.

Building Decline May Go Further

"It is now apparent, with reports in for the final month of 1929 from the mass of American cities and towns, that we have not yet reached the point of improved conditions in the building industry," says S. W. Straus & Co., New York. "Official figures received by S. W. Straus & Co. from 588 cities and towns of the country for building permits issued in December show a loss of 39 per cent compared with the same month of 1928 and of 19 per cent from November, 1929. For the entire year the same centers revealed a loss of 12 per cent from 1928 and 13 per cent from 1927. The total of permits issued in these places in December was \$154,957,653 and for the 12 months' period \$3,379,977,311. These figures, of course, are for building projects only and do not include engineering projects.

"While these reports may seem disturbing to those who have been looking for an immediate upturn in building activities, they are not out of line with conservative expectations. The period of high money, extending back over two years or more, followed by the spectacular crash in Wall Street in October and November have affected adversely general building progress throughout the country. Although we have now run into a period of cheap money, which may be regarded as a fortuitous circumstance from the builders' point of view, the effects of the stock market debacle cannot be quickly dissipated. The decline in building, it would appear, must still go further.

"The slower pace which has existed in the industry since the peak year of 1925 has undoubtedly taken up much of the building slack. Surpluses have been greatly curtailed and the fundamentals of the situation are sound. With a favorable money market and the efforts being put forth by industrial leaders throughout the nation to keep general business on the go, it may reasonably be expected that a turn for the better in building operations will be forthcoming by mid-year or possibly earlier."

Nitriding Non-Technically Discussed

A non-technical exposition of nitriding will feature the Feb. 12 meeting of the Worcester chapter, American Society for Steel Treating. Dr. V. O. Homerberg, professor of physical metallurgy, Massachusetts Institute of Technology, will be the speaker. In laymen's language and with lantern slides, Doctor Homerberg will describe the nitriding process as the metallurgist knows it today, and will show what the process means to the purchaser of the many mechanical units in which nitrided steels are being used or will be used.

Steel Furniture and Shelving Orders, Shipments and Unfilled Orders

	December, 1929	November, 1929	December, 1928
Steel furniture orders(a).....	\$2,583,220	\$2,900,452	\$3,610,645
do. do., 12 months.....	34,036,539	.....	35,974,117(b)
do. shipments.....	2,781,610	2,631,079	3,117,139
do. unfilled orders.....	2,166,294	2,345,471	2,409,985
Steel shelving orders(a).....	735,452(c)	801,223	828,555
do. do., 12 months.....	11,554,339(b)	.....	9,601,032
do. shipments.....	856,011	859,697	791,376
do. unfilled orders.....	823,870	950,439	757,429

(a) United States Department of Commerce.

(b) Highest total ever recorded.

(c) Smallest amount since July, 1928.

Steel Companies Report Large 1929 Earnings

The Inland Steel Co. reports total profits for 1929 at \$17,712,430. After the usual deductions for Federal taxes, interest and depreciation, the amount left as net profit is \$11,712,374, equivalent to \$9.76 per share on the common stock outstanding. A dividend of \$1 per common share for the fourth quarter was declared, payable March 1 to holders of record Feb. 14.

Continental Shares, Inc., the Cleveland investment company, which played an important part in the consummation of negotiations for the \$335,000,000 Republic Steel Corporation merger, in its annual report for 1929 shows an expansion in capital stock and surplus from \$29,770,334 to \$101,969,349. Discussing the new Republic combination, the report expresses the belief that benefits accruing from centralized management and important economies should substantially enhance the intrinsic value of the securities of the companies involved. C. S. Eaton is chairman of Continental Shares and W. R. Burwell is president. T. M. Girdler, formerly president of Jones & Laughlin Steel Corporation, who will be chairman of the new Republic Steel Corporation, is a member of the advisory board.

The Jones & Laughlin Steel Corporation, Pittsburgh, had net income of \$20,848,749 in 1929, as compared with \$15,568,687 in the preceding year and with \$11,238,939 in 1927. After deducting \$8,720,575 for common and preferred dividend payments, balance carried to surplus in 1929 amounted to \$12,128,174, and after appropriation for pension fund total surplus amounted to \$72,897,638. In the quarter ended Dec. 31, 1929, net income amounted to \$3,852,836, as against \$5,690,226 in the preceding quarter and \$3,919,234 in the last quarter of 1928.

The Wheeling Steel Corporation and subsidiaries report in 1929 net profit totaled \$8,005,664, after interest, depreciation, exhaustion of minerals, Federal taxes and other charges. This is equivalent, after dividends on the 8 per cent A preferred and 10 per cent B preferred shares, to \$13.56 a share on the 394,819 shares of outstanding common stock. It compares with net profit of \$6,443,739, equivalent, after preferred dividends, to \$9.60 a share on the common stock in 1928.

The balance sheet of the Newton Steel Co. as of Sept. 30, 1929, shows total assets of \$13,002,923, compared with \$10,175,827 on Dec. 31, 1928, and surplus of \$4,002,079, compared with \$2,681,760. Current assets were given as \$5,143,744 and current liabilities as \$968,523 on Sept. 30, 1929, compared

with \$5,749,931 and \$1,515,963, respectively, on Dec. 31, 1928.

Directors of the National Steel Corporation have declared an initial quarterly dividend of 50c. a share, payable March 10 to stock of record March 3, placing the stock of the company on a \$2 annual basis. The companies merged to form the National Steel Corporation report for 1929 net profits of \$12,573,683, equivalent after charges, depreciation, depletion, Federal taxes and other charges to \$6.07 a share on the 2,072,000 shares of capital stock outstanding.

Joseph T. Ryerson & Son, Inc., for the year ended Dec. 31, 1929, reports net profit of \$2,308,084, after all charges, including Federal taxes and depreciation. This is equal to \$5.77 a share earned on 400,000 shares of capital stock, against \$4.56 a share earned in 1928. In a statement to the stockholders, Donald M. Ryerson, chairman, said: "Attention is called to the improvement of our financial condition in that although we have paid an extra dividend in 1929 we have increased our working capital by \$1,050,000, and reduced our debenture obligation by \$100,000 in the operation of the sinking fund. While there are some signs that 1930 may be a steel year of somewhat reduced activity compared with 1929, there is already evident improvement in production rate from the condition prevailing in December."

The Ohio Seamless Tube Co., Shelby, Ohio, reports profits available for dividends during 1929 of \$470,000, which, after preferred disbursement, left \$360,000 for common stock or approximately \$4.65 a share as against \$6.48 the year before. During the year the company expended \$420,000 in new buildings, retired 700 shares of preferred stock and closed the year without its working capital being impaired, but has reduced the common dividend for the current quarter to 50c. a share.

Indianapolis Employers' Annual Meeting

The Associated Employers of Indianapolis held their twenty-sixth annual dinner meeting at the Columbia Club, Indianapolis, Tuesday, Feb. 4, at 6.30 p. m. Speakers were Harry F. Atwood, Chicago, president of the Constitution Educational Association, Inc., who spoke on "Our Constitution, the Bulwark of Peace, Progress and Prosperity," and John B. Maling, Hammond, Ind., who discussed "Business Stability, Founded on Social Justice Under American Principles."

Colorado Fuel & Iron Co., Pueblo, Colo., has awarded a contract to the Koppers Construction Co. for by-product coke ovens and auxiliary equipment.

Record Output of Steel Barrels in 1929

WASHINGTON, Jan. 31.—Production of steel barrels in 1929 totaled 8,338,266 units, representing 58.2 per cent of capacity, against 7,397,785 or 53.2 per cent of capacity in 1928, according to reports received by the Department of Commerce from 27 companies owning or operating 31 plants. Shipments for the two years were 8,315,369 and 7,403,726 barrels respectively.

Production and shipments, which always hang closely together, were by far the largest ever made, 1928 having been the previous record in both. The totals were almost double those of 1924, when output was first reported.

The output of barrels in December was 624,365 units, or 54.7 per cent of capacity, compared with 572,621 or 50.8 per cent of capacity in November (the lowest since last February), and 551,113 or 47.1 per cent of capacity in December, 1928. Shipments in December totaled 618,003 barrels, compared with 567,257 units in November and 549,913 in December, 1928.

Stocks at the end of December were 67,938, compared with 61,576 at the end of November. Unfilled orders at the end of December for delivery within 30 days were 294,797 barrels, compared with 285,295 at the end of November, while unfilled orders for delivery beyond 30 days were 1,044,136 and 708,306 barrels respectively.

December shipments of members of the Steel Barrel Manufacturers Institute are reported at 456,340 units, the volume of business for the month having been \$1,333,417. Capacity was engaged to an average of 42.2 per cent, that for I.C.C. barrels having been used to the extent of 26.5 per cent and that for light barrels to 48.4 per cent.

Trade Practices for Gray Iron Foundries

John S. Schofield, Macon, Ga., recently elected president of the Southern Metal Trades Association, is completing a set of trade practice agreements for gray iron foundries, which will soon be published. In a recent pamphlet addressed to the metal trades industry of the South, entitled "One for All and All for Each," Mr. Schofield emphasizes the value of group activity.

First place in the annual drafting contest for apprentices held on Dec. 9 and 10, 1929, by the Milwaukee branch of the National Metal Trades Association was won by Ronald Eyrich, employed by the Allis-Chalmers Mfg. Co., according to an announcement made by W. J. Fairbairn, secretary of the Milwaukee branch. Second place was won by Arthur Nolde, Falk Corporation, and third place by Edgar Sundby, Nordberg Mfg. Co.

PERSONAL

EDWARD W. SMITH has been appointed general manager of sales of the Pittsburgh Steel Co., Pittsburgh, succeeding GEORGE W. JONES, who has retired on account of ill health. Mr. Smith began his business career with the Pittsburgh Steel Co. 26 years ago, and in the period since that time has served in different capacities chiefly in connection with sales activities, marked by repeated promotions to more responsible positions.

RICHARD B. CARR has retired as manager of sales of the rail, plate, bar and shape department of the United States Steel Products Co.'s Pacific Coast offices after a connection of 29 years in the business. From 1897 to 1899 he acted as a manufacturer's agent in Chicago and on July 1, 1899, became Chicago representative for the New Philadelphia Iron & Steel Co. For a year he was with the sales department of the American Hoop Co. and at the time of the formation of the United States Steel Corporation was general manager of sales at New York. He then became associated with the sales department of the Carnegie Steel Co., and in 1905 was transferred to San Francisco.

E. C. WALDVOGEL, vice-president in charge of sales of the Yale & Towne Mfg. Co., Stamford, Conn., will retire from active participation in the company's affairs on April 1, but will continue in an advisory capacity and remain as vice-president. He has been connected with the company for the past 25 years. WALTER B. DODGE, who has been his assistant, has been appointed manager of all Stamford hardware sales. JAMES C. MORGAN, for 10 years with the Yale & Towne company, has been placed in charge of sales of materials-handling equipment.

RAY P. FARRINGTON, who has been appointed representative of the Follansbee Brothers Co. for the Philadelphia territory, brings to his position a well-rounded experience in the manufacture, use and sale of sheet metal products. After graduation from Penn State College in 1906, and an experience in the construction of the Talbot open-hearth plant No. 2 at the South-Side works of the Jones & Laughlin Steel Corporation of Pittsburgh, he was instructor for two years in mining and metallurgy at the University of Pittsburgh. He then spent some time in the different departments of the West Penn Steel Co., Brackenridge, Pa., and in 1910 became associated with MacFarland & Little, Philadelphia, in charge of sales for several companies. Later he incorporated the Ray P. Farrington Co. to handle the sale of sheets, tin plate, steel containers, etc. In 1922 he became a buyer and manufacturer when, with Leo Heintz, former works manager of the Edward G. Budd Mfg. Co., he organized the Heintz Mfg. Co., with Mr. Heintz as president and Mr. Farrington as vice-president and treasurer. His present offices are in the Bank of Philadelphia and Trust Building.

ELMER A. SPERRY was the recipient of a gold medal of the American Iron and Steel Institute at a meeting of the board of directors of the institute at the Metropolitan Club, New York, on Jan. 31. The award was made at the general meeting of the institute on Oct. 25, 1929, but the medal could not be presented at that time because Doctor Sperry was in Japan. The medal was one of two given in memory of Judge Gary. The other was presented to JAMES A. FARRELL, president, United States Steel Corporation, for distinguished service to the steel industry. That given to Doctor

Sperry was for his paper on "Non-Destructive Detection of Flaws," presented at the May, 1928, meeting of the institute.

EDWARD A. WAGNER, general manager of the Pittsfield, Mass., works of the General Electric Co., was the guest of the Kiwanis Club of that city last week. He said the General Electric Co. spends \$1,500,000 annually in the Pittsfield plant laboratories in research work.

C. H. SMITH, president of the Steel Improvement & Forge Co., Cleveland, was elected president of the American Drop Forging Institute at its recent business meeting held at the Engineers' Club, New York. E. R. BISHOP, Globe Forgings & Foundries, Syracuse, N. Y., was elected vice-president.

A. C. MORSE, at the annual meeting, Jan. 31, resigned as president and general manager of the Ohio Seamless Tube Co., Shelby, Ohio, of which he has been head for the past 15 years, and has been made chairman of the board. He was succeeded by EDWARD MANSFIELD as president and FRANK BENHAM as general manager.

C. V. MCKAIG, manager of bar and hoop production for the Carnegie Steel Co., Pittsburgh, left that position on Feb. 1 to become vice-president in charge of sales of the Great Lakes Steel Corporation, Detroit. He is a graduate of Princeton University, and soon after leaving college went to work for the Park works, Pittsburgh, of the Crucible Steel Co. of America. He served this company in various capacities in the operating department. He went with the Carnegie Steel Co. about 20 years ago, and for two or three years was engaged in the order department. He was then appointed assistant to I. W. Jenks, general manager of the bar and hoop department, and succeeded Mr. Jenks in this capacity upon the latter's retirement in April, 1929. Mr. McKaig is a member of the



E. W. SMITH



R. B. CARR



E. C. WALDVOGEL



R. P. FARRINGTON

Society of Automotive Engineers and of the American Iron & Steel Institute.

W. S. ORR and VANCE A. CRONK, of the Freyn Engineering Co., Chicago, returned to Leningrad, U. S. S. R., Feb. 1, after a stay of one month in the United States. WILLIAM T. MARTERSTECK will sail on Feb. 8 for the same destination to join the group of engineers of the Freyn company engaged in iron and steel work in Russia.

J. M. WATSON, chief metallurgist, Hupp Motor Car Corporation, Detroit, and vice-president of the American Society for Steel Treating, will address the Canton-Massillon chapter of the Society, Feb. 20, on the heat treatment of automotive steels.

NELSON R. REHNQUIST, in charge of purchasing and stores and also charged with aircraft executive duties, and HOWARD R. GASS, in the sales department, have been elected vice-presidents of the St. Louis Car Co., St. Louis. GEORGE L. KIPPENBERGER, vice-president, has been made first vice-president and assistant general manager.

HENRY HARNISCHFEGGER, president and one of the founders of the Harnischfeger Corporation, Milwaukee, manufacturer of power shovels and cranes, has donated \$50,000 to build a new school house in his native town of Salmuenster, Germany, to replace the old school building which had been attended by children of the community for more than 200 years and at which Mr. Harnischfeger attended until he was 13 years old. He will sail, May 14, for a three months' sojourn in Europe, during the course of which he will see the new school house under construction.

A. W. REMENSNYDER has been elected treasurer of the Duquesne Steel Foundry Co., Pittsburgh.

M. W. SEYMOUR, heretofore of the Bethlehem, Pa., office of the Roller-Smith Co., New York, has been transferred to the home office as sales engineer. H. D. STIER represents the company in Alabama, Florida, Georgia, North and South Carolina.

ELMER G. KNAPP, who has been assistant purchasing agent of the General Railway Signal Co., Rochester, N. Y., for the past four years, has been made purchasing agent, succeeding HARRY C. FREY, who has been appointed assistant to vice-president F. W. MOFFETT. Mr. Frey has been in railroad work for 43 years, the past 25 of which with the General Railway Signal Co.

THOMAS O'NEIL, for 10 years manager of eastern sales for the Milwaukee Corrugating Co., has resigned to become eastern district sales manager for the Penn Metal Co., Parkersburg, W. Va.

FREDERICK ALAN SCHAFF, vice-president of the Superheater Co., New York, since 1915, has been elected president, succeeding GEORGE L. BOURNE, who has been made chairman of the board.

DANIEL A. DALY, heretofore with Standard Steel Sections, Inc., New York, has become head of the Steel Trade Credit Association of New York.

L. E. HOWE has resigned from the sales department of the Acme Steel Co., Chicago, and has become affiliated with the sales department of the Brainard Steel Corporation, Warren, Ohio. He will be in charge of a Chicago office to be opened by the latter company.

THOMAS M. JEWELL, superintendent of merchant mills, Wisconsin Steel Co., Chicago, has retired from active service after 28 years with the company and has been succeeded by E. A. JENKINS, his assistant. Mr. Jenkins has been with the Wisconsin company for over 28 years.

J. V. EMMONS, metallurgist, Cleveland Twist Drill Co., Cleveland, will address the Feb. 6 meeting of the Boston chapter, American Society for Steel Treating, on "Characteristics of Modern Cutting Tool Materials."

W. B. SIMPSON, former president, has been elected chairman of the board and A. C. CASTLE, former vice-president, has been made president of A. M. Castle & Co., Chicago. FRED C. FLOSI has been elected director to take the place of SIDNEY GARDINER.

J. P. KEENE, president, and associates have purchased the interests of dissenting stockholders in the Youngstown Boiler & Tank Co. and have elected four new directors: H. R. Hooper, W. C. Holzworth, C. R. Holzworth and A. M. Henderson. These men replace Philip Wick, R. W. Patterson and R. I. Ingalls, who, with representatives of the Wick Estate, asked a receivership for the company, because of differences over policies.

H. K. BROWNING, formerly district sales representative in St. Louis for the A. M. Byers Co., has been appointed division manager of sales on the Pacific Coast, with offices in the Crocker First National Bank Building, San Francisco. C. F. CEASER and J. A. ARMSTRONG, for the past several years in the San Francisco and Los Angeles offices respectively, have been appointed district sales representatives in the respective cities. H. F. ESTILL, of the St. Louis office, has been made district sales representative in the Pacific Northwest and will make his headquarters in Seattle.

E. E. LEVAN has been appointed general sales manager of the Haynes Stellite Co., New York, and J. H. MAGUIRE has become works manager.

Other appointments included F. T. MCCURDY, as plant superintendent, J. R. BROWN, F. L. SECORD and EVERETT PAGE, assistants to the superintendent and L. H. BROWN, research engineer.

Osborne Company Club Holds Annual Meeting

The Harmony Club, composed of executives and salesmen of the J. M. & L. A. Osborne Co., Cleveland, recently held its annual meeting, during which talks were made by representatives of several manufacturers. R. J. Anderson, vice-president, Fairmont Mfg. Co., discussed aluminum sheets; T. H. Belling, assistant sales manager, Black & Decker Mfg. Co., talked on Black & Decker products; Frank Reed and George R. Kinney, Niagara Machine & Tool Works, the Niagara line; John F. Herkenhoff, the Minster Machine Co., Minster presses, and G. W. Breiel, American Rolling Mill Co., Armco products. New officers were elected as follows: A. W. Howe, chairman; J. T. Hagan, vice-chairman; J. W. Kuhl, secretary, and M. J. Doering, treasurer.

Lavish Entertainment at Conventions Condemned

"Lavish, unwarranted and wholesale entertainment" at conventions is condemned by the American Oil Burner Association, in a recent bulletin, as inimical to the best interests of the industry. Exhibitors and others attending the seventh annual convention and the National Oil Burner Show, to be held by the association in Chicago during the week of April 7, are asked to cooperate in the "abatement of such practices."

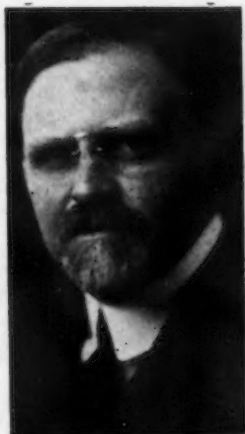
New York Chemists to Hear Address on Aluminum

Present-Day Aspects of the Aluminum Industry will be the subject of an address by Dr. Francis C. Frary, director of research, Aluminum Co. of America, New Kensington, Pa., before a joint meeting of the New York sections of various chemical societies at the Chemists' Club, Friday evening, Feb. 14. Dr. Frary, who is also president of the American Electrochemical Society, will supplement his lecture with some demonstrations of the characteristics of aluminum and its alloys, particularly in relation to the remarkable results obtained by new methods of heat treatment recently developed.

The Michigan Tool Co., Detroit, manufacturer of cutters and precision tools, has awarded the Austin Co., Cleveland, a contract for the design and construction of a plant at Carey Street and Six Mile Road, Detroit, to cost \$300,000. This will be of steel frame construction, one and two stories in height, 190 x 260 ft.

OBITUARY

EDWARD LODER WHITEMORE, chairman of the board of the National Malleable & Steel Castings Co., Cleveland, died of heart failure at his home in Cleveland Heights, Jan. 29, aged 69 years. He was born at Rye, N. Y., and attended Adelphi Academy and Polytechnic Institute of Brooklyn, N. Y., and later Park Institute, from which he was graduated in 1879. He was graduated from the Sheffield Scientific School of Yale University in 1882 and started his business career



E. L. WHITEMORE

with the Bridgeport Malleable Iron Co., remaining with that company for five years. He then became secretary and treasurer of the Indianapolis Malleable Iron Co., and took charge of that plant. Three years later he became manager of the Toledo Malleable Iron Co., and for a time had charge of both the Indianapolis and Toledo plants. When the National Malleable Castings Co. (now the National Malleable & Steel Castings Co.) was formed by a merger of the Cleveland, Chicago, Indianapolis and Toledo Malleable Iron companies, he was made vice-president. In 1913 he was elected chairman of the board, which position he held at the time of his death. He was also a director of the Interlake Iron Corporation and the Eastern Malleable Iron Co., Naugatuck, Conn.

EDWIN S. GRIFFITHS, retired Cleveland manufacturer, died at Miami Beach, Fla., Jan. 25, aged 58 years. He was born in Wales and had lived in Cleveland since he was a young man. He organized in 1890 and was president of the Cleveland Machine & Mfg. Co., formerly engaged in the manufacture of rolling mill machinery. In 1915 he became president of the Bishop & Babcock Co., Cleveland, and later was chairman of the board but retired from this company when it was reorganized. He also had various other Cleveland interests.

FRANCIS COLE PRATT, former vice-president and chairman of the manufacturing committee of the General Electric Co., died Jan. 26 in New York, after an illness of six weeks. He was born in 1867 at Hartford, Conn., and was graduated from the Sheffield Scientific School of Yale University in 1888. After graduation he became associated with the Pratt & Whitney Co., of which his father was president and one of the founders, continuing with them until he became vice-president. Mr. Pratt joined the General Electric Co. in 1906 as assistant to E. W. Rice, in charge of manufacturing and engineering. He was made assistant to the president in 1913 and was elected vice-president in 1919, retiring in 1927.

ALBERT P. LOESCH, manager of sales in the Philadelphia district for the Wrought Iron Co. of America, died of heart failure Jan. 21, aged 41 years. He had been engaged in the sale of iron products throughout his entire business career. His first connection was with Sloan, Howell & Co., who represented the Lebanon Iron Co. He later went with the Scranton Bolt & Nut Co.

FRANK H. GUPPY, secretary and one of the founders of the Superior Steel Products Co., Monaca, Pa., died at his home in Patterson Heights, Pa., Jan. 30. Prior to the organization of this company, Mr. Guppy had been identified in an official capacity with the Moltrup Steel Products Co., Beaver Falls, Pa.

P. L. SOWERSBY, Cleveland manager of the Crane Co., Chicago, died Jan. 29, after two weeks' illness of pneumonia, aged 47 years. He had been connected with the Crane Co. nearly 28 years. Previous to being transferred to Cleveland two years ago he represented that company in Rochester for 10 years.

FRANK J. BRITTINGHAM, Pittsburgh district manager for the Cleveland Crane & Engineering Co., Cleveland, died suddenly on Jan. 27 at the Columbia Hospital, Pittsburgh, aged 46 years. He was born at Michigan City, Ind., and attended Purdue University, from which he was graduated in electrical engineering in 1905. He immediately entered the apprenticeship course of the Westinghouse Electric & Mfg. Co., East Pittsburgh, and four years later was transferred to the company's Minneapolis office. He went with the Cleveland company in 1911 as Pittsburgh district manager.

JOHN OLLE, president, Racine Brass & Iron Works, Racine, Wis., died Jan. 28, aged 59 years.

ROBERT C. ZANNOTH, president and general manager of the Roberts Brass

Co., Milwaukee, which he founded in 1924, died Jan. 25, of heart disease, aged 63 years.

GEORGE T. HONSTAIN, chairman of the board and founder of the Western Crucible Steel Casting Co., Minneapolis, died Jan. 16, aged 71 years. He was born at Muscoda, Wis., and moved to Minneapolis in 1888, where he at first engaged in the contracting business.

WARREN PHELPS KING, a vice-president of the Aluminum Co. of America, Pittsburgh, who died of a heart attack at Sarasota, Fla., on Jan. 15, as reported in THE IRON AGE of Jan. 23, was born in Ithaca, N. Y., in 1865, and



W. P. KING

was a member of the class of 1888 at Cornell University. His first business connections were with the Lehigh Valley Coal Co. in Buffalo. Later, he was associated with the New York Car Wheel Co. as assistant to the president. About 1907, he bought into the Brooks Brothers Brass Foundry Co., and when this company was reorganized as the Liberty Brass Foundry Co., he was made president. In 1910, the Liberty company merged with the Allyne Brass Foundry Co. and others to form the Aluminum Castings Co. Of the merged companies, he became vice-president in charge of sales. The Aluminum Castings Co. was reorganized in November, 1919, as the Aluminum Manufacturers, Inc., with Mr. King first as vice-president and then president. He was a large factor in the inception and development of the casting of aluminum under gravity pressure in metallic molds in America, a process which now is used extensively in the making of aluminum castings. He also recognized the suitability of this method for the making of aluminum alloy piston castings, and it was largely from his initiative that this product and process were developed.

H. P. NORTH, for more than 20 years engaged in the scrap business in Philadelphia, died at his home in that city, Jan. 22, following a long illness.

Fabricated Structural Steel

Week's Total of 52,500 Tons Follows 53,000 Tons in Preceding Week—New Work Only 10,500 Tons

AWARDS of 52,500 tons of structural steel in the past week confirmed the upward trend in building projects revealed in the previous week, when lettings totaled 53,000 tons, as compared with much lower totals in the preceding weeks of the new year. The largest award was 13,000 tons for a bridge at McKees Rocks, Pa. Buildings for the Aluminum Co. of America to be erected at Alcoa, Tenn., call for 5100 tons and subway construction in Philadelphia takes 3350 tons. Other awards were 2900 tons for a bridge at Oil City, Pa.; 2400 tons additional for the Empire State Building, New York, and 2800 tons for the open-hearth plant of Republic Iron & Steel Co., Youngstown, besides a considerable number of smaller projects. New work that came into the market totaled about 10,500 tons, an addition to the New York Curb Exchange requiring 2500 tons, and 2000 tons for a bridge in Newark, N. J., being the outstanding projects. Awards follow:

WASHINGTON, 300 tons steel piling, breakwater at Pea Patch Island in Delaware River for Navy Department; bids open Feb. 11.

HARTFORD, CONN., 350 tons, Hartford Electric Light Co. unit, to Eastern Bridge & Structural Co.

NEW YORK, 1800 tons, store and office building for Steuben Club, Fifty-eighth Street and Lexington Avenue, to unnamed fabricator.

NEW YORK, 1700 tons, Unit No. 10, Tudor City, for Fred F. French Corporation, to Harris Structural Steel Co.

NEW YORK, 700 tons, apartment building, 123 East Nineteenth Street, to Lehigh Structural Steel Co.

NEW YORK, 400 tons, public school No. 138 in Queens, to Lehigh Structural Steel Co.

NEW YORK, 700 tons, apartment building at 338 East Seventy-second Street, to Harris Structural Steel Co.

NEW YORK, 1500 tons, apartment hotel on Horatio Street, to Taylor-Fichter Steel Construction Co.

NEW YORK, 1200 tons, apartment building on East Ninety-sixth Street, to Dreier Iron Works.

NEW YORK, 900 tons, Unit No. 2, Hunter College, to Lehigh Structural Steel Co.

NEW YORK, 1650 tons, eight hangars for Barren Island, to American Bridge Co.

NEW YORK, 2400 tons, part of Empire State Building, to McClintic-Marshall Co.

PHILADELPHIA, 3350 tons, Eighth Street subway, awarded by Henry W. Horst, contractor, to Bethlehem Steel Co.

BALTIMORE, 600 tons, addition to plant of Western Electric Co., to Belmont Iron Works.

LITITZ, PA., 575 tons, building for paper mill, to A. B. Rote Co., Lancaster, Pa.

SAN ANTONIO, TEX., 300 tons, power station, to Houston Structural Steel Co.

SPRINGFIELD, ILL., 1700 tons, Public Service Co. of Central Illinois, to McClintic-Marshall Co.

ATLANTA, GA., 1000 tons, office building for Healey Real Estate & Investment Co., to Virginia Bridge & Iron Co.

BARTOW, FLA., 625 tons, Southern Phosphate & Chemical Co., to Nashville Bridge Co.

ALABAMA CITY, ALA., 465 tons, Gulf States Steel Co. plant, to Virginia Bridge & Iron Co. and Nashville Bridge Co.

TUSCALOOSA, ALA., 135 tons, Alabama Union Building, to Nashville Bridge Co.

JACKSON, MISS., 250 tons, Hinds County Court House, to Virginia Bridge & Iron Co.

ALCOA, TENN., 5100 tons, buildings for Aluminum Co. of America, to McClintic-Marshall Co.

McKEES ROCKS, PA., 13,000 tons, bridge across Ohio River, to Fort Pitt Bridge Co.

OIL CITY, PA., 2900 tons, Allegheny River bridge for Pennsylvania Railroad, to McClintic-Marshall Co.

AKRON, OHIO, 490 tons, Thornton Street viaduct, to Berger Iron Works.

DAYTON, OHIO, 460 tons, Government airport building, to Dayton Structural Steel Co.

YOUNGSTOWN, 2800 tons for reinforcing open-hearth buildings of Republic Iron & Steel Co., to McClintic-Marshall Co.

PERE MARQUETTE RAILROAD, 1400 tons, bridge at Detroit, to American Bridge Co.

BIG FOUR RAILROAD, 400 tons, bridge at Indianapolis, to American Bridge Co.

KIMBERLY, WIS., 400 tons, building for Kimberly Clark Co., to Vulcan Iron Works, Fond du Lac.

RACINE, WIS., 150 tons, viaduct for Milwaukee Electric Railway & Light Co., to Milwaukee Bridge Co.

CAMBER, OKLA., 500 tons, railroad bridge, to Kansas City Structural Steel Co.

PORT ANGELES, WASH., 600 tons addition to pulp plant of Olympic Forest Products Co., to Isaacson Iron Works.

OMAK, WASH., 282 tons, plates, 22-in. riveted pipe line, to Steel Tank & Pipe Co.

SACRAMENTO, 325 tons, American River bridge, to Palm Iron Works.

LOS ANGELES, 1000 tons, office building, 621 South Spring Street, to Consolidated Steel Corporation.

LOS ANGELES, 184 tons, pipe warehouse for Crane Co., to Consolidated Steel Corporation.

LOS ANGELES, 166 tons, factory in Hollywood, to Consolidated Steel Corporation.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON & MAINE RAILROAD, 500 tons, bridge at Claremont, N. H.

NEW YORK, 2500 tons, addition to New York Curb Exchange; Thompson & Starrett Co., general contractor.

NEW YORK, 3000 tons, Manhattan-Brooklyn subway, section 4, route 103, originally reported as 10,500 tons but reduced by revision of plans.

NEW YORK, 750 tons, New York Telephone exchange in Bronx.

BROOKLYN, 300 tons, Nurses' Home for Caledonian Hospital.

NEW YORK CENTRAL RAILROAD, 400 tons, bascule bridge at New Hamburg, N. Y.

NEWARK, N. J., 2000 tons, Haynes Avenue bridge; J. Rich Steers, Inc., New York, low bidder.

PHILADELPHIA, 600 tons, Olney Avenue bridge.

WASHINGTON, 700 tons, Mount Vernon Memorial Bridge.

NICKEL PLATE RAILROAD, 300 tons for bridge work, alternate bids for reinforcing concrete.

TOLEDO, 450 tons, Toledo University; new bids asked.

MILWAUKEE, tonnage to be announced about Feb. 8, addition to Government building and Post Office; bids March 5.

MILWAUKEE, 700 tons, viaduct for Milwaukee Electric Railway & Light Co.

SAN FRANCISCO, 1500 tons, United States Marine Hospital.

PORTLAND, ORE., 1800 tons, Meir & Frank store; bids to be taken soon.

Reinforcing Steel

Week Has Been Quiet—Awards Total 2000 Tons

LETTINGS of reinforcing steel reported the past week declined sharply and, at 2000 tons, were the smallest so far this year. Tonnages were mostly in small lots. New projects also fell off, calling for only 2000 tons. Awards follow:

BINGHAMTON, N. Y., 400 tons, New York Telephone building, to Concrete Steel Co.

CINCINNATI, 265 tons, new building, The Cincinnati Board of Education, to the Pollak Steel Co.

SPRINGFIELD, ILL., 100 tons, Public Service Co. of Central Illinois, to Laclede Steel Co.

SACRAMENTO, 254 tons, highway work in Imperial County, to unnamed bidder.

SAN FRANCISCO, 130 tons, dyeing plant on Mission Street, to W. S. Wetenhall Co.

PHOENIX, ARIZ., 896 tons, bridge over Salt River; general contract to Lynch-Cannon Co., Los Angeles, bars to unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

LANGLEY, WEST VA., 545 tons, seaplane channel at Langley Field.

PENNSYLVANIA RAILROAD, 112 tons, bridge south of Sunbury, Pa.

PHILADELPHIA, 230 tons, school at Fifth and Fitzwater Streets; bids in.

CLEVELAND, 300 tons, foundation for Nickel Plate bridge at Seventy-ninth Street.

CLEVELAND, 200 tons, National Town and Country Club building.

CINCINNATI, 212 tons, building for Jewish Hospital.

CHICAGO, 150 tons, building for United Autographic Co.

CHICAGO, 150 tons, building for Sanitary District trustees.

SACRAMENTO, 250 tons, highway work in San Luis Obispo County; bids opened.

SACRAMENTO, 119 tons, highway work in Santa Barbara County; bids opened.

SAN FRANCISCO, 110 tons, office building, Fell and Baker Streets; bids opened.

Jones & Laughlin Steel Corporation has removed its Los Angeles, Cal., district sales office to 416 Roosevelt Building.

European Makers in Need of Good Orders

Running on Hand-to-Mouth Basis—Cartels Unsettle Continental Prices—German Pig Iron Market Is Dull—British Shipyards Active

(By Cable)

LONDON, ENGLAND, Feb. 3.

THE iron and steel markets are quiet generally, and makers are disappointed that demand has not revived. Pig iron consumers are believed to be in need of supplies, but are refraining from contracting in expectation of lower prices. Furnaces are maintaining prices, however, in spite of cheaper fuel.

Hematite producers are approaching the completion of current contracts without adequate new business on their books. In consequence sales at £3 18s. (\$19.03) per ton for mixed numbers are not uncommon.

Finished steel is generally dull, especially for export. Works rolling heavy material are fairly well engaged on current domestic orders, but new business is lagging. Steel prices are likely to advance in the near future, as a revised wage scale is impending for the lower paid workers, consisting of increases, ranging from 1s. to 5s. (24c. to \$1.22) weekly. Improvement in production methods and working conditions is also in prospect.

Clyde shipbuilding in January was 13 vessels of 25,200 tons.

Tin plate is quiet but inquiry is improving, showing that supplies are needed. Members of the tin plate makers association are well booked and asking firm prices. Makers outside the agreement are inclined to shade prices.

Galvanized sheets are slightly more active, but mills are in need of good orders. Japan has bought some small

lots of black sheets, but the market is otherwise quiet. William Beardmore & Co., Ltd., Glasgow, and David Colville & Sons, Ltd., have entered into a working agreement by which the Colville company takes over the plate, shape, rail and billet business of William Beardmore & Co. The Beardmore interests have closed the Parkhead Forge, Rolling Mills & Steel Works, Glasgow, transferring the work to the Colville plant. The Parkhead mills are concentrating on heavy forgings.

The Continental market is affected by cartel uncertainties, but increased interest in buying is displayed by con-

sumers here. European sellers are maintaining the agreed minimum prices, but there is some dissatisfaction, and steel mills will meet Feb. 15 to readjust the export quotations. The sales office of the Belgian steel mills begins to operate from Feb. 8.

French output in December was 874,000 metric tons of pig iron and 813,000 tons of raw steel.

The Continental Tube Cartel has been extended for another 10 years, an agreement having been reached between British and American producers. A meeting of the International Tube Cartel has been arranged provisionally for March.

German Prices Unchanged—Export Pig Iron Weak

(By Radio)

BERLIN, GERMANY, Feb. 3.

DOMESTIC steel prices and such export prices as are fixed by the international cartels are unchanged for February. Price reductions granted by the Ingot Steel Syndicate to exporting manufacturers have been increased in certain instances.

The domestic pig iron market is decidedly dull and export prices on pig iron have been lacking in strength as a result of concessions granted by the West European Pig Iron Entente. Certain semi-finished products are also less firm, but export business began to improve toward the end of January.

Business in light gage sheets is be-

ginning to increase and prices are firmer in expectation that present plans to establish a thin sheets syndicate will be successful. The German Tube Syndicate reports a slightly improved export market.

Net profits of the Vereinigte Stahlwerke A. G., Düsseldorf, for the business year 1928 to 1929, totaled 49,000,000 m. (\$11,662,000), compared with 48,000,000 m. (\$11,424,000) in the preceding business year.

Wire Rod Cartel Quotes C. I. F. Prices for Export

HAMBURG, GERMANY, Jan. 20.—At the meeting of the International Wire Rod Cartel in Paris, the total allotment was increased from 475,000 metric tons to 485,000 tons for the

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at \$4.88

British Prices f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3 12½s. to £3 12½s.	\$17.69 to \$17.93
East Coast hematite...	3 18 to 4 0	19.03 to 19.52
Ferromanganese, export	12 5 to 12 15	59.42 to 62.22
Billets, open-hearth...	6 2½ to 6 12½	29.89 to 32.33
Sheet bars, open-hearth	5 17½ to 6 5	28.67 to 30.50
Black sheets, Japanese specifications	12 10 to 12 10	61.00 to 61.00
Tin plate, per base box	0 18½ to 0 18½	4.48 to 4.51
Rails, 60 lb. and heavier	7 15 to 8 15	37.59 to 42.43
Cents per Lb.		
Steel bars, open-hearth...	8 0 to 8 10	1.74 to 1.85
Beams, open-hearth...	7 7½ to 7 17½	1.60 to 1.72
Channels, open-hearth...	7 12½ to 8 12½	1.66 to 1.91
Angles, open-hearth...	7 7½ to 7 17½	1.60 to 1.72
Ship plates, open-hearth	7 15 to 8 5	1.69 to 1.79
Black sheets, No. 24 gage	9 15 to 10 0	2.12 to 2.18
Galvanized sheets, No. 24 gage	11 15 to 12 0	2.56 to 2.57

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3 7s. to £3 11½s.	\$16.35 to \$17.45
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3 5 to 3 6	15.86 to 16.11
Billets, Thomas...	4 11 to 4 12½	22.20 to 22.57

Sheet bars, Thomas...	4 11 to 4 13	22.20 to 22.65
Wire rods, low C., No. 5 B.W.G.	6 2 to 6 4	29.77 to 30.26
Rails, 60 lb. and heavier	6 8½ to 6 10*	31.35 to 31.72
Rails, light	6 0	29.28
Cents per Lb.		
Steel bars, merchant...	5 5 to 5 6	1.14 to 1.15
Steel bars, deformed...	5 3 to 5 5	1.12 to 1.14
Beams, Thomas, British standard	5 0 to 5 4	1.09 to 1.13
Channels, Thomas, American sections...	5 12 to 5 14	1.22 to 1.24
Angles, Thomas, 4-in. and larger, over ¾-in. thick	5 0 to 5 6	1.09 to 1.15
Angles, Thomas, 3-in.	5 6	1.14
Ship plates open-hearth inspected	7 2 to 7 5	1.55 to 1.58
Black sheets, No. 31 gage, Japanese	12 1 to 12 2	2.61 to 2.65
Hoop and strip steel over 6-in. base	5 11½ to 5 12½	1.21 to 1.22
Wire, plain, No. 8 gage	7 0	1.52
Wire, galvanized, No. 8 gage	8 7½	1.82
Wire, barbed, 4-pt. No. 12 B.W.G.	11 0	2.40
Wire nails, base	0 6¼	\$1.55 per keg
Wire nails, assortments 1 to 6-in. keg	10 6¼	2.69

*Open-hearth steel, 8s. (\$1.94) per ton extra.

first quarter of this year. In the future, cartel members agreed to quote only c.i.f. prices for export instead of f.o.b. European port, as in the past. Official prices for wire rods, fixed each month, have been abandoned with the adoption of c.i.f. quotations, but the following are given as the asking prices for export business: C.i.f. Japan, £7 9s. to £7 12s. 6d. (\$36.36 to \$37.21) per ton; c.i.f. Pacific and Gulf ports of the United States, £7 to £7 2s. 6d. (\$34.16 to \$34.77) per ton; c.i.f. Liverpool, £6 17s. 6d. (\$33.55) per ton; c.i.f. Buenos Aires, Argentina, £7 5s. (\$35.38) per ton; c.i.f. Toronto or Montreal, Canada, £7 (\$34.16) per ton.

German Hardware Makers Oppose Standardization

HAMBURG, GERMANY, Jan. 20.—A large part of the German hardware manufacturing industry is opposed to further efforts toward standardization of hardware products. They point out that the German hardware manufacturing industry depends on export trade for a large percentage of its business, certain manufacturers shipping as much as 75 per cent to foreign buyers. Sizes and designs of hardware satisfactory to the German consumer, and which are used as the basis for establishing standards in the campaign for elimination of waste, are usually unsatisfactory to the foreign user and efforts to sell these standardized products for export have met with failure. As a result the industry is forced to produce a wide variety of products in many sizes.

United Steel Works Buys Steel House Company

DÜSSELDORF, GERMANY, Jan. 20.—All shares in the Stahlhaus G.m.b.H. have been acquired by the Vereinigte Stahlwerke A. G. The business of the Stahlhaus G.m.b.H., fabricating steel dwellings, has been growing rapidly, especially for export, and with complete control of the company by the Vereinigte Stahlwerke further expansion of foreign trade is expected in this direction.

German Machinery Business Declining

HAMBURG, GERMANY, Jan. 20.—Domestic machinery business is dull and export orders are diminishing, says a recent report of the German machinery manufacturers. Using an index of 100 for the volume of export orders in the first half of 1927, the second half of that year stood at 105, all of 1928 at 126, the first half of 1929 at 168, and the second half of 1929 at 162. The index of domestic orders, which was 100 in 1927, was 91 in 1928 and 79 in 1929.

British Shipyards Are Active

Building Half World's Tonnage—Pig Iron at Unprofitable Price Level—New Mergers Expected

LONDON, ENGLAND, Jan. 17. — Inquiries for pig iron have begun to increase after the holiday lull, but furnaces are not finding it easy to book new tonnage and claim that there is but little profit in the sales they do make. There is, however, a certain degree of confidence in the future. The Consett Iron Co. has decided to blow in its No. 8 furnace. This is one of the largest in the country, and will produce hematite.

The hematite market is fairly active. Makers have been able to sell abroad, particularly to Italy, and have succeeded in raising their selling prices to a more profitable level. Makers of foundry and forge iron, however, have had to rely on domestic consumption, as they cannot compete abroad, and in addition have had to contend with some competition from the Continent, a moderate tonnage having been imported last year. There are, however, a number of construction and railroad electrification and reconstruction projects which will eventually require large quantities of steel, and this will indirectly aid the pig iron market.

At present shipbuilding is the most active consumer of heavy steel prod-

ucts. Lloyd's Register shows that the tonnage under construction in this country at the end of last year was 1,560,254 tons, compared with 1,242,794 tons at the close of 1928. The number of vessels was 356, compared with 271 at the end of 1928. Of the vessels under construction 221 were steam-driven, 121 motor-driven and 14 non-propelling craft. The world's total construction at the close of 1929 was 798 vessels of 3,110,880 tons, so that the British proportion was 50.2 per cent.

The financial collapse of the Hatry interests brought the abandonment of an ambitious plan for rationalizing the British steel industry, but a number of other combinations of steel producers are being negotiated, which, if carried out, will effect important groupings and facilitate the ultimate unification of the industry. Possible mergers of companies in the Sheffield district and in the Cleveland district are being discussed, and in South Wales the recent grouping of Guest, Keen & Nettlefolds, Ltd., and Baldwins, Ltd., may be extended to include Richard Thomas & Co., Ltd., and the Ebbw Vale Steel, Iron & Coal Co., Ltd.

Goes to Russia for Forge Shop Construction

Charles Butterworth, for several years connected with the Chrysler Corporation at Newcastle, Ind., as efficiency engineer in the forge division, is to sail from New York Feb. 6 for Moscow, Russia, where he will be associated with the government institute for rationalization of production and with the institute for designing new metal plants in Lenin-grad.

His new work calls for the setting up, installation and equipping of three large forge plants, heat treating and cold trimming departments. The engineering firm with which he will be connected has plants under way for the Salingrad Tractor factory; the Arthur J. Brant Reconstruction Moscow automobile plant and the Hercules Motor Co., maker of heavy truck engines.

German State Railroads Adopt Steel Ties

Steel railroad ties are replacing wooden ones now in use on the German State railroads at the rate of 800 kilometers a year under a new construction program which calls for the substitution over about three-fourths of the total mileage of the road, according to a correspondent's despatch in a recent issue of the *Ironmonger*, of London.

Only in localities, such as tunnels

and along the coast line, where the humidity is very high, will the wooden ties be retained. Copper bearing metal, containing from 0.2 to 0.25 per cent copper, will be used in industrial localities.

Extensive experiments with metal sleepers were conducted before replacement was decided on. Increased vibration and noise, two factors long considered correlative to the use of metal ties, have been overcome, it is stated, with a new type rail. Recent tests with the new rails, now adopted as standard, indicate a reduction of vibration for metal ties to within 3 per cent of the figure for wooden ties; and a noise differential even less. The State system comprises over 97 per cent of the total railroad mileage in the republic.

German Wire Rope Cartel Closes Small Mills

HAMBURG, GERMANY, Jan. 13.—The German Wire Rope Syndicate, the membership of which is 11 mills, has recently been buying control of small non-member plants and closing them, distributing the capacities as additional allotments among themselves. Since last November four small works have been closed by purchase, and negotiations have been started with two more. The industry is operating at 66 to 68 per cent of rated capacity, despite a 100 per cent increase in export business since 1927.

Where Steel Exports Went in 1929

Canada Took 683,093 Tons of Nine Leading Items—Japan Retains Second Position with 144,171 Tons, Followed by Argentina, 57,255 Tons; Philippines, 57,224 Tons; Mexico, 46,575 Tons; Chile, 43,629 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Totals	11,305	18,736	193,695	166,269	12,078	13,759	154,533	152,280	9,365	12,766	170,782	179,286
Canada	8,858	15,952	161,950	140,876	1,191	2,095	30,435	32,039	3,632	7,260	90,077	84,495
Japan	81	...	2,764	1,619	60	1,629	4,084	4,361	2,271	2,207	25,383	62,548
Cuba	41	47	1,164	1,129	566	565	6,245	5,883	69	76	1,308	1,910
Philippine Islands	194	...	2,048	3,152	3,792	2,216	35,902	22,131	...	191	2,598	3,006
Mexico	163	26	1,180	1,101	382	715	11,688	8,544	399	323	3,257	2,685
Argentina	...	...	...	...	744	458	6,273	7,461	803	17	7,104	1,494
Chile	...	...	...	...	...	...	...	...	65	22	4,989	2,449
Colombia	...	...	...	...	...	...	...	...	8	10	441	389

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Totals	10,034	12,114	149,234	190,905	4,397	5,371	64,463	74,335	3,275	3,581	45,629	46,177
Canada	2,103	624	24,486	25,369	18	468	2,536	3,677	627	1,007	2,500	15,639
Japan	1,117	3,460	11,330	18,344	...	...	...	...	78	163	1,254	1,677
Cuba	1,268	2	8,186	4,239	394	30	3,933	4,590	43	55	1,284	997
Philippine Islands	617	1,203	10,158	5,476	338	268	5,846	2,865	40	81	672	351
Mexico	1,002	417	6,949	6,597	668	442	7,006	6,006	219	204	2,305	2,213
Argentina	...	59	3,676	4,300	1,053	1,276	9,410	14,621	1,124	416	8,828	10,626
Chile	541	1,984	23,107	28,281	...	...	...	...	52	52	475	408
Colombia	7	542	4,107	10,582	221	542	5,352	4,311	...	...	...	...
Brazil	2,051	1,831	15,479	21,547	589	1,022	11,264	17,382	116	268	1,384	1,405

	Tin Plate				Steel Bars				Heavy Plain Structural Material			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Totals	24,522	17,507	258,965	249,642	8,268	14,937	190,023	158,475	14,841	17,086	273,096	202,804
Canada	3,681	4,394	46,213	48,283	4,044	9,155	94,848	101,843	12,440	14,370	230,048	171,399
Japan	5,143	4,675	61,814	55,991	854	1,051	28,196	6,522	13	300	9,346	2,387
Cuba	275	320	5,518	4,073	180	383	4,033	4,387	173	88	2,863	5,282
Mexico	1,066	1,002	11,048	13,921	118	51	1,787	742	206	57	1,355	1,177
Argentina	2,723	1,697	18,899	22,460	6	140	637	853	118	594	2,428	966
Chile	506	560	5,101	4,823	...	...	...	...	371	132	9,957	3,850
Brazil	221	201	11,460	7,945	...	...	...	...	...	...	...	...
China	2,914	2,337	28,966	22,210	...	...	...	...	...	...	...	...
British India	395	8	8,395	7,823	...	...	...	...	...	...	...	...
United Kingdom	...	...	...	...	1,570	1,266	24,544	17,831	...	...	...	...
Italy	151	275	5,688	5,165	...	...	...	...	...	...	...	...

Destination of Iron and Steel Exports (In Gross Tons)

Country of Destination	December, 1929	January Through December		Country of Destination	December, 1929	January Through December	
	1929	1929	1928		1929	1929	1928
North and Central America and West Indies	82,329	1,503,582	1,420,469	Italy	6,405	109,512	90,011
Canada and Newfoundland...	61,312	1,230,378	1,181,010	Netherlands	347	3,110	2,332
Cuba	4,663	68,377	65,205	Poland and Danzig	4	75,102	63,412
Guatemala	453	7,542	8,058	Rumania	194	3,973	4,647
Honduras	385	9,532	6,915	Soviet Russia	2,543	13,613	2,781
Mexico	11,321	107,766	83,116	United Kingdom	4,591	67,317	54,069
Panama	1,233	19,541	17,118	Other Europe	1,057	36,605	20,207
Salvador	177	6,702	3,258	Far East	78,535	749,412	708,833
British West Indies	1,240	18,046	7,651	British Malaya	438	9,519	6,457
Other West Indies	1,251	26,061	39,635	China	4,190	68,407	92,837
Other Central America	294	9,637	8,503	Netherlands East Indies	3,754	61,142	40,726
South America	32,957	395,675	438,319	India and Ceylon	941	21,065	25,509
Argentina	9,628	94,036	98,443	Japan	54,338	427,755	411,754
Brazil	6,360	71,864	83,900	Kwantung	505	11,709	14,021
Chile	3,897	67,917	69,875	Philippine Islands	9,433	102,301	84,217
Colombia	2,715	41,003	64,843	Australia	1,296	22,110	19,633
Peru	2,234	35,674	26,543	New Zealand	304	5,373	2,305
Uruguay	1,932	11,112	9,038	Other Asia and Far East	3,336	20,031	11,374
Venezuela	5,521	67,851	80,499	Africa	5,395	31,624	14,201
Other South America	670	6,213	5,178	Union of South Africa	328	8,128	7,220
Europe	16,026	352,059	283,281	Egypt	4,977	18,568	3,793
Belgium	221	2,690	14,079	Mozambique	71	2,927	1,399
France	634	18,110	9,115	Other Africa	19	2,001	1,789
Germany	30	22,027	22,628	Total	215,242	3,032,352	2,865,102

Record Production of Steel Castings in 1929

WASHINGTON, Jan. 31.—Orders for commercial steel castings in 1929 totaled 1,328,970 net tons, or 76 per cent of capacity, against 1,000,283 tons, or 57 per cent of capacity, in 1928, according to reports received by the Department of Commerce from the principal manufacturers. Production totaled 1,345,045 tons, or 77 per cent of capacity, against 1,021,956 tons, or 58 per cent of capacity. Both figures made new high records.

Orders for railroad castings in 1929 were 594,803 tons, or 73 per cent of that class of capacity, against 389,863 tons, or 48 per cent of such capacity in the preceding year. Production of railroad castings was 573,065 tons, or 71 per cent of capacity, compared with 371,564 tons, or 46 per cent.

Orders for miscellaneous castings last year totaled 734,167 tons, or 78 per cent of such capacity, against 610,420 tons, or 64 per cent of such capacity. Production of miscellaneous castings totaled 771,980 tons, or 83 per cent of capacity, against 650,392 tons, or 68 per cent of capacity.

Orders in December were 85,940 tons, against 97,001 tons in November. December bookings were made up of 33,615 tons of railroad castings and 52,325 tons of miscellaneous castings, against 41,763 tons and 55,238 tons, respectively, in November.

Production in December was 102,023 tons, against 109,319 tons in November. The December output consisted of 33,807 tons of railroad castings and 68,216 tons of miscellaneous castings, comparing with 50,414 tons and 58,905 tons, respectively, in November.

Record Incoming Shipments of Iron Ore

Imports of iron ore in 1929 are reported by the United States Department of Commerce at 3,139,334 gross tons. This is much the largest total ever imported in one year—in fact, the first 11 months of 1929 exceeded any previous calendar year. The gain on 1928 was more than 650,000 tons, or approximately 26 per cent, and the gain on the previous record, made in 1923, was about 370,000 tons, or nearly 14 per cent. The 1923 total was 2,768,430 tons.

December showed 286,055 tons, the largest total since last August, a gain of more than 17,000 tons on Novem-

ber, and an increase of over 81,000 tons compared with a year earlier.

For the year Chile furnished 54 per cent of the aggregate, compared with 57 per cent in 1928.

Cuba stood in second position, both in December and in the year, having sent more than 20 per cent of the total annual supply. This is in contrast with 1928, when incoming shipments from French Africa were much higher than those from Cuba. Sweden stands in third position in 1929, but was much lower in 1928, because of a strike.

Of the 654,000 tons gained in 1929 over 1928, Chile furnished 264,000 tons; Cuba, 272,000 tons; and Sweden, 284,000 tons. Partially offsetting this large increase was a heavy decline in shipments from French Africa, aggregating 288,000 tons.

Lead Production Increased in 1929

Output of primary domestic desilverized lead in 1929 was about 382,000 tons; of soft lead about 250,000 tons, and of desilverized soft lead about 57,000 tons, making a total output from domestic ores of about 689,000 tons of refined lead, according to statistics compiled by the United States Bureau of Mines. Corresponding figures in 1928 were 351,734 tons of desilverized lead, 225,003 tons of soft lead, and 49,465 tons of desilverized soft lead, making a total of 626,202 tons.

The output of lead smelted and refined from foreign ore and bullion was about 103,000 tons, as compared with 154,869 tons in 1928. The total primary lead smelted or refined in the United States in 1929 was thus about 792,000 tons, as compared with a total of 781,071 tons in 1928—an increase of about 1 per cent. The output of primary antimonial lead in 1929 was about 26,000 tons, as compared with 33,058 tons in 1928.

Imports of refined pig lead for 11 months amounted to 1657 tons, of which 1064 tons came from Mexico. The exports of lead of foreign origin amounted to 49,731 tons, as compared with 102,067 tons exported in 1928. Exports of lead of domestic origin amounted to 18,839 tons, as compared with 14,202 tons exported in 1928. Exclusive of stocks of lead at smelters and refineries and estimating the amount of lead exported with benefit of drawback, for which figures are not available, it is calculated that the new

supply of lead made available for consumption in 1929 was about 718,000 tons, as compared with 657,565 tons in 1928.

Output of Zinc Larger in 1929

Output of primary metallic zinc from domestic ores in 1929 reported to the Bureau of Mines was about 610,700 tons and that from foreign ores was about 13,300 tons, a total of 624,000 tons, as compared with 591,525 tons from domestic ores and 11,056 tons from foreign ores, a total of 602,581 tons in 1928. In addition to the output of primary zinc there was an output of about 52,100 tons of redistilled secondary zinc, as compared with 48,666 tons in 1928, making a total supply of distilled and electrolytic zinc in 1929 of about 676,100 tons, composed of 235,700 tons of high grade and intermediate, 97,500 tons of select and brass special, and 342,900 tons of prime western zinc.

Of the total output of primary zinc in 1929, 157,300 tons was electrolytic zinc distributed as follows: Montana, 138,200 tons; Idaho, 16,500 tons, and Illinois, 2600 tons. The electrolytic zinc plant of the Evans-Wallowa Lead Co. at East St. Louis, Ill., was put into operation in September, 1929.

Imports of slab zinc for 11 months amounted to less than one ton. The exports of slab zinc made from domestic and foreign ores amounted to 18,502 tons, including 4887 tons of rolled zinc. The stock of zinc reported at smelters and electrolytic refineries Nov. 30 was about 72,700 tons. No slab zinc was reported in warehouse. The apparent consumption of primary zinc in 1929 was about 579,500 tons, relatively unchanged from the 578,060 tons reported as apparently consumed in 1928.

The total number of retorts at the 21 zinc smelters that operated during all or a part of the year was about 107,500. Of that number, about 62,200 were reported in operation at the end of November and 62,200 were expected to be in operation at the end of the year. At the end of 1928 there were 63,716 in operation at 19 plants.

Implement Sales Gain

Sales of agricultural machinery and equipment in December showed the usual expansion over the preceding month, according to a statement by the Federal Reserve Bank of Chicago. A seasonal gain of 14.2 per cent was reported in the tractor, thresher, combination harvester-thresher group and of 14.8 per cent in light machinery. In addition, the bank reported a recession of 38 per cent in barn equipment, which is also customary for the month. For the entire year 1929 the total value of sales billed to domestic and foreign customers by 83 concerns in the United States was 16.8 per cent larger than in 1928, the improvement having been shared by all three of the major groups.

SOURCES OF AMERICAN IMPORTS OF IRON ORE
(In Gross Tons)

	December		12 Months Ended December	
	1929	1928	1929	1928
Spain .....	.....	255	48,885	37,420
Sweden	22,108	.....	310,406	26,558
Canada	59	350	3,542	45,709
Cuba	51,000	48,000	641,350	369,286
Chile	186,438	113,960	1,699,066	1,434,860
French Africa	21,450	42,230	171,995	459,860
Other countries	5,000	4	264,090	111,353
Total	286,055	204,799	3,139,334	2,485,046

Machinery Markets and News of the Works

Inquiry Is Still Expanding

Actual Buying Remains Light—January Bookings Much Smaller Than a Year Ago

MACHINE tool sales in January exceeded expectations, but were smaller than in December and considerably less than in January, 1929. Current business is limited mainly to scattered orders for one or two machines, representing immediate requirements. If inquiries are accepted as an index, a rising volume of business in February and March is in prospect, but buyers are very slow in placing orders. Demand for small tools has held up well, but even in this class of product manufacturers' backlogs have shrunk materially.

The automotive industry, which has been virtually out of the machine tool

market for several months, has placed a little business at Detroit. Railroad buying in the Chicago district gives further promise of expanding. The Rock Island has issued a list of eight machine tools, and the Milwaukee, which last week inquired for a large number of tools for its locomotive shops, is reported to be preparing a sizable list for its car department. The Burlington is also expected to enter the market.

Among favorable straws in a situation that is still without a definite trend are improved collections and greater activity among small tool and die shops in the Chicago district.

New York

NEW YORK, Feb. 4.—Machine-tool buying still lacks definite trend. Some local sellers did more business in January than in December, but this was the exception and not the rule. In most instances, January sales were not only below those of December, but were considerably less than those of January, 1929. So far as inquiries may be an indication of future purchases, the outlook for a rising volume in February and March is fairly promising. A good many quotations have been made during the past month, but prospective buyers are slow to take action.

General Automatic Lock Nut Corporation, 1775 Broadway, New York, manufacturer of patented lock nuts, bolts, etc., has acquired property at Lebanon, Pa., and will remodel for new plant.

Holland Furnace Co., Holland, Mich., manufacturer of furnaces and heaters for domestic service, has leased two-story building at 5317 Twenty-first Avenue, Brooklyn, for a factory branch and distributing plant.

Seelig & Finkelstein, 153 Pierrepont Street, Brooklyn, architects, have plans for a two-story automobile service, repair and garage building, 65 x 135 ft., to cost about \$100,000 with equipment.

All-Metal Lighting Fixture Co., New York, has leased a floor in building at 97-103 East Houston Street for new plant.

O'Brien Brothers, Inc., 233 Broadway, New York, contractor, operating O'Brien

Brothers Towing Co., and O'Brien Brothers Sand & Gravel Corporation, address noted, has purchased shipyard of United Dry Dock, Inc., Rosebank, S. I., heretofore known as New York Harbor Dry Dock, and will remodel for boat repair works. United Dry Dock, Inc., comprising recent merger of a number of local shipbuilding and repair plants, is arranging to close down its Alderton plant in Brooklyn and will concentrate and expand operations at its Morse shipyard, Brooklyn; Staten Island Shipbuilding Co. plant, and local Crane and Fletcher shipyards. Shewan plant of company, foot of Twenty-seventh Street, Brooklyn, has been converted into a yacht basin.

Board of Education, Highland Falls, N. Y., is considering installation of manual training equipment in new two-story school to cost \$250,000, for which plans are being drawn by Tooker & Marsh, 101 Park Avenue, New York, architects.

Simmons Co., Kenosha, Wis., manufacturer of metal bedsteads, etc., has leased space in former plant of Robert Gair Co., Brooklyn, totaling 70,000 sq. ft. of floor space, and will use for local factory branch and distributing plant, part of space to be used similarly for Berkey & Gay Furniture Co., Grand Rapids, Mich., a subsidiary.

Springfield Body Works, Inc., Wilkey Street, Tarrytown, N. Y., manufacturer of automobile bodies, has asked bids on general contract for a one-story plant, to cost about \$24,000 with equipment. R. Adelt and P. C. Minnerly, Rose Hill Avenue, are architects.

Hirsch Iron Works, New York, has leased two-story building at 246 East

Thirty-seventh Street for general iron-working plant.

Rubel Corporation, 937 Fulton Street, Brooklyn, operating ice-manufacturing and cold storage plants, coal yards, etc., has plans for a two-story automobile service, repair and garage building, to cost \$140,000 with equipment. H. J. Nurick, 44 Court Street, is architect.

Rockland Light & Power Co., Nyack, N. Y., has authorized an increase in capital from \$12,200,000 to \$26,000,000, part of fund to be used for extensions and improvements.

Expansion program of Western Electric Co., 195 Broadway, New York, manufacturer of cable, telephone and radio apparatus, at Kearny, N. J., will consist of three eight-story and basement additions, instead of single structure, previously noted, to cost over \$1,000,000 with equipment. Bids have been asked on general contract. Condron & Post, 53 West Jackson Boulevard, Chicago, are architects and engineers.

Universal Roll Screen Co., Jersey City, N. J., has leased factory at 3-5 Hope Street, totaling 6250 sq. ft. of floor space, for new plant.

R. J. Letcher & Son, Fourth Avenue, Asbury Park, N. J., plumbing equipment and supplies, have awarded general contract to Hall-Carpenter Co., 317 Third Avenue, for a one-story equipment storage, pipe and mechanical shop, 75 x 150 ft., to cost about \$40,000 with equipment.

American Gas Products Corporation, 376 Lafayette Street, New York, manufacturer of gas heaters, gas fire regulators, etc., has leased former plant of Kelsey Motor Co., 740 Washington Avenue, Belleville, N. J., for new plant. New York works will be removed to new location and capacity increased.

Board of County Freeholders, Court House, Paterson, N. J., has plans for County airport at Preakness, consisting of hangars, repair shops, oil storage and other buildings, to cost about \$185,000 with equipment. Austin Co., New York, is architect and engineer.

Standard Welding & Spring Co., 744-48 Communipaw Avenue, Jersey City, N. J., has plans for a one-story addition, 25 x 118 ft., including improvements in present works, to cost about \$21,000. Christopher H. Zeigler, 26 Journal Square, is architect.

New England

BOSTON, Feb. 3.—January was a lean month with most machine-tool dealers. Inquiries, however, continue to be received, but buyers apparently are feeling out the market before making purchases. It is understood that negotiations are under way for some large tools which give promise of closing before the second quarter. Advances in the cost of new tools are increasing the call for used equipment, but there is still a dearth of machines wanted.

Despite the apathy in the machine-tool market, demand for small tools is holding up well, although sales are not as heavy as a year ago.

Malden Machine Tool Co., Malden, Mass., will soon have revised plans ready for a machine shop.

City of Westfield, Mass., has plans for a three-story trade school addition, 75 x 180 ft. Bids will be taken in April.

Martin Trailer Co., Westfield, Mass., has plans for a one-story, 80 x 100 ft. plant, to cost \$40,000 without equipment.

North Attleboro Foundry Co., North Attleboro, Mass., contemplates building a one-story foundry to replace structure recently destroyed by fire.

City of South Norwalk, Conn., has closed bids on a two-story, 63 x 184 ft. and 67 x 168 ft., junior high school to contain manual training shops, to cost \$350,000 without equipment.

Worcester Suburban Electric Co., Uxbridge, Mass., has plans for a substation at Grafton, Mass., and power line to cost \$100,000; also three similar stations at Douglas, Mass.

Bids will be asked early in March on general contract for new trade and vocational school at Meriden, Conn., by State Board of Education, Hartford, to cost over \$175,000 with equipment. Second and third floors will be equipped for machine shop, electrical shop, wood-working shop, silver shop and other mechanical departments. Lorenzo Hamilton, Inc., Meriden, is architect. A. S. Boynton is director of institution.

Rising Paper Co., Housatonic, Mass., has begun erection of three-story addition, 75 x 180 ft., for finishing department, to cost over \$100,000 with machinery. Company is affiliated with Strathmore Paper Co., Mittineague, Mass.

City Ice & Fuel Co., 6611 Euclid Avenue, Cleveland, has plans for a one-story ice-manufacturing plant at St. Albans, Vt., to cost about \$80,000 with equipment.

Edison Electric Illuminating Co., 39 Boylston Street, Boston, has purchased property at Roxbury, as site for new semi-automatic power substation to cost over \$75,000 with equipment.

Warren Foundry & Pipe Co., 201 Devonshire Street, Boston, has awarded general contract to Casper Ranger Construction Co., 129 Newbury Street, for one-story pipe foundry at Everett, Mass., 400 x 400 ft., with part of space for storage and distribution, to cost over \$350,000 with equipment. French & Hubbard, 210 South Street, Boston, are engineers.

Cumberland County Power & Light Co., Portland, Me., will offer a bond issue of \$1,000,000, proceeds to be used for extensions and improvements, including construction of steel tower transmission line from local generating plant to power station of Central Maine Power Co. at Lewiston, Me.

New Haven Gas Light Co., New Haven, Conn., will make extensions and improvements in plant on Chapel Street, including machine shop enlargements, establishment of meter repair department in extension to be built, and other mechanical facilities, entire project to cost more than \$60,000. United Engineers & Constructors, Inc., 112 North Broad Street, Philadelphia, is engineer.

Rubel Coal & Ice Corporation, 937 Fulton Street, Brooklyn, N. Y., has plans for one-story ice-manufacturing plant at Dorchester, Boston, to cost \$125,000 with machinery, which will be electrically operated. A. W. K. Billings, 80 Boylston Street, Boston, is architect.

The Crane Market

A GOOD volume of inquiry is in the market for overhead traveling cranes, active pending business at present including upward of 30 cranes, including a list of seven expected to be closed this week. Inquiry for locomotive cranes is rather small, but both the railroads and general contractors are expected to issue some fair inquiries within the next few weeks.

Among recent purchases are:

General Electric Co., Schenectady, N. Y., 20-ton, gasoline-driven locomotive crane from Orton Crane & Shovel Co.

Management & Engineering Corporation, St. Louis, 6-ton, gasoline operated crawl-tread crane from Orton Crane & Shovel Co.

Logan County Court Road Department, Kistler, West Va., $\frac{1}{2}$ cu. yd., gasoline driven crawl-tread crane from Orton Crane & Shovel Co.

Southern Railway, Washington, two 12-ton, crawl-tread cranes, reported purchased from Northwest Engineering Co.

Bucyrus-Erie Co., Milwaukee, 10-ton, 62-ft. span overhead electric crane from unnamed builder.

Ontario Copper Refining Co., Carteret, N. J., 15-ton crawl-tread crane for Canada, from unnamed builder.

Lockwood Greene Engineers, Inc., New York, 5-ton electric overhead crane for W. J. Gamble, Allentown, Pa., from Shepard Niles Crane & Hoist Corporation.

American Car & Foundry Co., Milton, Pa., 10-ton overhead traveling crane from unnamed builder.

Etheridge Machine & Foundry Co., 442-44 Fore Street, Portland, Me., will rebuild part of plant recently damaged by fire.

Philadelphia

PHILADELPHIA, Feb. 3.—Liquid Carbonic Co., 3100 South Kedzie Avenue, Chicago, will make extensions and improvements in plant of Dry Ice Corporation of America, Inc., 2345 Washington Avenue, Philadelphia, manufacturer of non-liquid freezing products, an affiliated organization to cost over \$85,000.

Lincoln-Circle, Inc., Mascher and Turner Streets, Philadelphia, refined oils and petroleum products, is considering rebuilding four-story factory destroyed by fire Jan. 28.

Pennsylvania Railroad Co., Philadelphia, has asked bids on general contract for an addition to engine house at South Philadelphia terminal yard, including repair shop facilities, to cost more than \$75,000 with equipment. William H. Cookman is company architect, address noted.

McCloskey Varnish Co., Thirtieth and Locust Streets, Philadelphia, has awarded a general contract to F. V. Warren Co., 1913 Arch Street, for two-story factory on site, 150 x 600 ft., at Holmesburg Junction, to cost over \$100,000 with equipment. Present factory will be removed to new location. Olsen & Sook, Philadelphia, are architects.

Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, is disposing of a preferred stock issue to total \$8,449,155, part of proceeds to be used for

extensions and improvements. Company will double capacity of Powelton substation, at a cost of more than \$1,000,000, and will increase transmission lines in that section. New steel tower transmission line will be built in Montgomery and Bucks counties to New Hope, for connection with system of Public Service Electric & Gas Co., Newark, N. J., to cost \$750,000. Philip L. Chase is chief engineer of Philadelphia company.

Cork Insulation Co., 154 Nassau St., New York, manufacturer of insulating products, has acquired 13 acre tract near Marine Terminal, Wilmington, Del., as site for new plant. Plans for initial unit, to cost over \$125,000 with equipment, will be prepared at once. Other units will be built later.

P. H. Glatfelter Co., Spring Grove, Pa., is planning an addition to paper mill, to cost more than \$75,000 with equipment. Land is being secured adjoining plant for enlargement.

Aetna Lampcraft Co., Philadelphia, has leased space in Building No. 8, at Emsley Mills, Emerald and Hagert Streets, for new plant to manufacture electric lighting fixtures and equipment.

Officials of Pennsylvania Water & Power Co., Holtwood, Pa., with executive offices in Lexington Building, Baltimore, have organized Safe Harbor Water Power Corporation to take over and consolidate company of similar name and Chanceford Water Power Corporation. New organization has plans for a hydroelectric generating plant at Safe Harbor, Pa., to cost about \$25,000,000, including steel tower transmission line to Baltimore and vicinity, and for connection with system of Holtwood Company. J. E. Aldred is chairman of board of directors, and Charles E. F. Clarke, president.

Penn Screw & Machine Works, 708-712 Cherry Street, manufacturer of special screw machine products and special parts turned from bar, has taken additional space to take care of increased business.

South Atlantic

BALTIMORE, Feb. 3.—General Motors Corporation, Detroit, has awarded general contract to John Golder, Baltimore, for factory branch, service, parts and sales building for Chevrolet Motor Co. at Baltimore, one and two stories, 115 x 290 ft., to cost over \$125,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer. Structure will be owned by Argonaut Realty Corporation, an affiliated organization.

Locke Insulator Corporation, Cromwell and Charles Streets, Baltimore, manufacturer of high-tension electrical insulators, has awarded general contract to Charles L. Stockhausen Co., Gay and Water Streets, for three one and two-story additions, to cost more than \$75,000 with equipment. W. S. Austin, Maryland Trust Building, is architect and engineer.

Cranford Furniture Co., Asheboro, N. C., has plans for a new factory to manufacture dining room furniture, all machinery to be electrically operated. Initial unit will cost more than \$100,000 with equipment. Edward Cranford is head.

Ford Motor Co., Detroit, has plans for expansion at assembling plant at Norfolk, Va., to cost about \$1,500,000 with equipment.

Carolina Cork Roll Co., Charlotte, N. C., recently organized to manufacture cork rollers and kindred equipment for textile

mills, has leased space in Nicholson Building on College Street for new plant to be ready for operation in March. Company has authorized capital of \$75,000, and is headed by L. S. Hereford and L. W. Cuddy, both of Charlotte.

Washington Airport, Inc., National Press Building, Washington, has filed plans for terminal airport, consisting of hangar, 125 x 130 ft., mechanical shop, oil storage and other buildings at local airport, to cost over \$90,000 with equipment. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is engineer.

Shell Eastern Petroleum Products Co., 112 East Forty-second Street, New York, is planning new oil storage and distributing plant at Berkley, near Norfolk, Va., to cost over \$100,000 with equipment.

Maryland Air Conditioning Corporation, Baltimore, has purchased former local plant of Bentz Engineering Co., Newark, N. J., manufacturer of kindred machinery, and will use for main plant. Expansion in output will be arranged. Bentz company has also closed its plant at 661 Frelinghuysen Avenue, Newark.

Raleigh Gas Co., 414 Fayetteville Street, Raleigh, N. C., has approved plans for new artificial gas plant, to cost over \$80,000 with equipment. A storage holder will be built with capacity of 250,000 cu. ft. Walter Whetstone is president.

Fisher Corporation, Money Point, Va., is considering rebuilding part of plant destroyed by fire Jan. 23.

Graybar Electric Co., 420 Lexington Avenue, New York, electrical equipment and supplies, has plans for a one and two-story factory branch and distributing plant, 60 x 170 ft., at Charlotte, N. C., to cost about \$65,000 with equipment. Lockwood Greene Engineers, Inc., 9 West Third Street, Charlotte, is architect and engineer. M. C. Beckner is local manager at Charlotte.

Duke Power Co., Charlotte, N. C., is planning expansion and improvements to double present generating capacity, including extensions in steel tower transmission lines.

Pittsburgh

PITTSBURGH, Feb. 3.—While there is some variation in the reports about business in machine tools, most dealers appear to be satisfied with the results of the first month of the new year. It is doubtful whether sales came up to expectations, but inquiry has been good and much encouragement to hopes of future business has lately been derived from an inquiry for several tools from the Pennsylvania Railroad. The Westinghouse Electric & Mfg. Co., which has split its quarterly requirements into three lists and includes some tools for the Emeryville, Cal., plant, has not yet done much buying against those lists, which, in the aggregate, are the largest ever put out by the company. Replacement orders for machine tools are fairly constant.

Standard Oil Co. of Pennsylvania, Inc., Peoples Gas Building, Pittsburgh, has awarded a general contract to Nicola Building Co., 6388 Pennsylvania Avenue, for storage and distributing plant at Midland, Pa., including pumping station, garage and service building, mechanical shop, etc., to cost over \$80,000 with equipment.

Harvey Paper Mills Co., Wellsburg, W. Va., manufacturer of paper bags and

containers for heavy duty, has awarded general contract to Austin Co. for addition, 100 x 240 ft., to cost over \$200,000 with machinery.

Tri-State Refining Co., Kenova, W. Va., is planning to rebuild part of oil refinery destroyed by fire Jan. 24.

United Fuel Gas Co., Charleston, W. Va., is planning for expansion in natural gas properties to cost about \$1,800,000, including new meter and regulator stations, pipe lines and wells, with compressor plants, etc. Company operates Huntington Development & Gas Co., Huntington, W. Va., and will carry out part of development in that district.

Odin Stove Mfg. Co., 314 West Twelfth Street, Erie, Pa., is planning one-story addition and improvements in present unit, to cost about \$30,000 with equipment.

Detroit

DETROIT, Feb. 3.—Michigan Tool Co., 147 Joseph Campau Avenue, Detroit, manufacturer of cutters, reamers and other precision tools, has awarded general contract to Austin Co. for new plant, to cost over \$225,000 with equipment.

Michigan Fertilizer Co., Highmont Street, Lansing, Mich., is contemplating new unit for production of sulphuric acid, to cost about \$40,000 with equipment. Project will be carried out within six to eight months.

Board of Education, Flint, Mich., is considering installation of manual training equipment in two-story addition to Northern high school, to cost \$450,000, for which plans are to be drawn by Malcolmson & Higginbotham & Trout, 1219 Griswold Street, Detroit, architects.

New interests have acquired plant and business of Acme Motor Truck Co., Cadillac, manufacturer of motor trucks and parts, at receiver's sale. Plans are under way for organization of new company to take over property and resume production. Improvements will be made.

Handy Wax Corporation, Grand Rapids, manufacturer of wax papers, etc., will more than double capacity of plant in connection with an expansion program. Automatic machinery and auxiliary equipment will be installed.

Consumers Power Co., Jackson, is planning expansion and improvements at plants in Muskegon district to cost about \$4,000,000, including two power substations, transmission lines and distributing system. In Lansing district, company is planning extensions to cost \$1,500,000, including installation of new equipment in local artificial gas plant. A new automobile service, repair and garage building and laboratory unit will be built; new coke-handling equipment will be installed.

G. A. Wood, Inc., Marysville, operating a boat-building and repair plant, is completing a new one-story plant, 140 x 550 ft., costing over \$200,000 including equipment.

Wayne County Board of Commissioners, Barlum Tower, Detroit, has plans for hangar at county airport, including repair and reconditioning facilities, to cost about \$40,000. Giffels & Vallet, Marquette Building, are architects.

R. G. Moeller Co., 8900 Livernois Avenue, Detroit, construction equipment and supplies, has awarded general contract to H. C. Wright Building Co., 6177 West Warren Avenue, for a one-story storage and distributing plant, to cost about \$25,000.

Buffalo

BUFFALO, Feb. 3.—Agfa-Ansco Co., Binghamton, N. Y., manufacturer of cameras, photographic equipment, lenses, etc., has plans drawn for an addition to cost over \$75,000 with equipment. Otto S. Schlich, 136 Liberty Street, New York, is architect and engineer.

Carbon-Monoxide Eliminating Valve Corporation, Buffalo, care of Harold G. Conger, Prudential Building, attorney, recently organized by local interests, plans early operation of plant in this vicinity to manufacture patented valve for automobiles.

Onedacraft, Inc., Onelda, N. Y., manufacturer of furniture, has plans for a four-story addition, to cost about \$175,000 with equipment, and will soon ask bids on general contract.

Buffalo Sintering Corporation, 10 Marilla Street, Buffalo, has taken out a permit for a one-story addition, to cost about \$85,000 with equipment.

St. Regis Paper Co., Watertown, N. Y., is planning a one-story addition, 65 x 100 ft., to machine department at branch mill at Oswego, N. Y., operated under name of Taggart Oswego Paper & Bag Corporation, to cost over \$80,000 with equipment.

Cleveland

CLEVELAND, Feb. 3.—Machine-tool sales in January were somewhat better in volume than was predicted early in the month. While business with local dealers was less than in January last year, it was better than in the corresponding months of 1927 and 1928. A lathe manufacturer reports that its January sales were 65 per cent of normal, being larger than was expected early in the month. Business during the week was confined to single orders from widely diversified industries. In Detroit a little business came from the automotive industry which has bought practically no machine tools for several months.

Iron Fireman Co., Portland, Ore., has acquired a plant at Lorain Avenue and West 116th Street, Cleveland, from Timken-Detroit Axle Co. and will operate as Eastern branch. Company manufactures automatic stokers.

Crucible Steel Casting Co., Almira Avenue and Thirty-Fourth Street, Cleveland, is taking bids on general contract for one-story foundry addition, with storage and distributing unit, to cost over \$45,000 with equipment. George S. Rider Co., Marshall Building, is architect and engineer.

Board of City Trustees, Waterville, Ohio, is considering a municipal electric light and power plant to cost about \$60,000 with equipment.

Soline Oil Co., 265 Jefferson Avenue, Cleveland, is considering rebuilding oil storage and distributing plant, recently destroyed by fire.

Youngstown Boiler & Tank Co., Youngstown, Ohio, manufacturer of steel oil tanks and other plate products, is arranging an expansion and betterment program. Capital will be increased from \$200,000 to \$500,000, part of fund to be used for purpose noted. Company was acquired recently by James P. Keene and associates.

Thew Shovel Co., Fulton and East Twenty-eighth Streets, Lorain, Ohio,

manufacturer of excavating machinery and other heavy equipment, is contemplating a one-story addition, to cost over \$45,000 with machinery.

Ohio Power Co., Newark, Ohio, has acquired three-story building at East Liverpool, Ohio, and will remodel for an equipment storage and distributing plant, including repair department, to cost about \$55,000.

Chicago

CHICAGO, Feb. 3.—The machine-tool market shows improvement in both inquiry and sales. The request of the Rock Island railroad for several machines is taken by the trade as a forerunner of more extensive inquiries. The Milwaukee road, which last week issued a list for its locomotive shops, is said to be preparing a sizable list for its car department; it is reported that the Burlington also will soon be in the market.

The Chicago Board of Education will buy a 10-in. grinder, a ½-in. bench-type radial drill, and an 11-in. x 4-ft. wood-working lathe. Small tool and die shops in this district are finding work more plentiful, and their interest both in new machine tools and good used equipment is growing.

The Rock Island will buy the following tools:

- One tool-room lathe.
- One 5-ft. radial drill.
- One 42-in. carwheel lathe.
- One 36-in. crank shaper.
- One No. 4 vertical miller.
- One horizontal boring and drilling machine.
- One cutter grinder.
- One 48-in. carwheel borer.

Chicago Rolling Mills Co. has started operation at its plant at 120th Street. Its product is sheet steel in thicknesses up to ¾ in.

Plant of Chicago Tool Co., 123 North Sangamon Street, Chicago, was badly damaged by fire Jan. 26.

J. Friedlander Furniture Co., 181 East Sixteenth Street, Chicago Heights, Ill., is considering a five-story addition, to cost over \$100,000 with equipment.

C. A. Dunham Co., 450 East Ohio Street, Chicago, manufacturer of heating equipment, is contemplating an addition to plant at Marshalltown, Iowa, to cost over \$50,000 with equipment.

Iowa Public Service Co., Waterloo, Iowa, has arranged for a bond issue of \$1,000,000, part of proceeds to be used for extensions and betterments.

Board of Education, City Hall, Minneapolis, is considering a multi-story repair, supply and mechanical shop, to cost about \$275,000 with equipment. It is expected to ask bids on general contract in spring. Bureau of Buildings, Division of Design and Inspection, 245 Ninth Avenue, North, is architect and engineer. George F. Womrath is business manager.

Mathias Klein & Sons, 3200 Belmont Avenue, Chicago, manufacturer of line-men's tools, has awarded general contract to Zimmerman Brothers, 4022 North La Porte Avenue, for one-story addition, 64 x 145 ft., to cost about \$35,000 with equipment. C. W. Lampe, 155 North Clark Street, is architect.

Chicago, Burlington & Quincy Railroad Co., 547 North Jackson Boulevard, Chicago, is considering addition to engine

house, with new machine shop, coaling shed and other structures at Sterling, Colo., to cost about \$100,000 with equipment.

LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa, manufacturer of steel dump wagons, tractors, etc., is contemplating a one-story addition, to cost about \$60,000 with equipment.

Common Council, Adams, Minn., is considering installation of a municipal electric light and power plant.

Production schedules at Rock Island Farmall tractor plant of International Harvester Co. have been increased to 200 tractors and 230 motors daily, compared with 125 tractors and 160 tractors a month ago. Export shipments, it was stated, were largely responsible for step-up in schedules.

Milwaukee

MILWAUKEE, Feb. 3.—Machine tool dealers and manufacturers report increases in both inquiries and pending business, but sales are usually confined to single items. Return to full schedules in almost all metal-working plants is expected by March. The greatest activity at present is noticeable among manufacturers of farm implements, tractors, road and building construction equipment, automobile parts and electrical machinery. There is an increase in the demand for woodworking machinery.

General Bronze Corporation, Milwaukee Works, will double output of ornamental bronze products with construction of a new fabricating plant, 150 x 250 ft., and a foundry, 100 x 200 ft., at a cost of about \$100,000, following an expenditure recently of \$125,000 for additions and equipment to foundry formerly operated by Wisconsin Ornamental Iron & Bronze Co., merged last year with General Bronze Corporation.

Milwaukee Electric Crane & Hoist Corporation, 5921 Greenfield Avenue, West Allis, Wis., has awarded general contract to Wisconsin Bridge & Iron Co. for a \$30,000 crane runway, 60 x 200 ft., about 22 ft. high. M. H. Harry is superintendent of construction.

Line Material Co., South Milwaukee, Wis., manufacturer of electric transmission line equipment, is taking bids on construction and mechanical equipment for a factory addition, three stories, 60 x 120 ft.

Common Council, Eau Claire, Wis., has appointed Alvord, Burdick & Howson, consulting engineers, 8 South Dearborn Street, Chicago, to design a water purification plant to cost \$240,000 and an additional well supply to cost \$29,000. O. E. Oien is city clerk.

Board of Vocational Education, Racine, Wis., has awarded general contract for construction of first unit of new vocational school, three stories, 68 x 128 ft., to Bondgard Construction Co., Racine. T. S. Rees is director of board.

Allis-Chalmers Mfg. Co., Milwaukee, has received a \$3,500,000 order for 1850 tractors from Amtorg Trading Corporation, New York, to be delivered to Soviet Government, Russia, by March 10. Representatives of Allis-Chalmers company will go to Russia to give instructions on operation and upkeep of the machines at Central maintenance plants at each collective farm.

Indiana

INDIANAPOLIS, Feb. 3.—Board of Trustees, Indiana Soldiers' and Sailors' Orphans Home, Knightstown, is asking bids until Feb. 11 for one-story and basement power plant, 72 x 100 ft., including electric generators and engines, boilers, stokers, coal and ash-handling and storage equipment, etc., as per plans, at office of McGuire & Shook, 941 North Meridian Street, Indianapolis, architects. John M. Rotz Engineering Co., Merchants' Bank Building, Indianapolis, is engineer.

American Foundry Co., 531 South Warman Avenue, Indianapolis, is planning to rebuild part of plant destroyed by fire Jan. 25, with loss reported at over \$500,000, of which about \$200,000 represents equipment. Blaine H. Miller is president.

J. R. Monaghan, 2960 Capitol Avenue, Indianapolis, architect, has plans for a multi-story automobile service, repair and garage building, to cost about \$200,000 with equipment.

State Line Generating Co., Hammond, affiliated with Commonwealth Edison Co., 72 West Adams Street, Chicago, and Northern Indiana Public Service Co., Hammond, has plans for extensions in steam-operated electric generating plant, including installation of two new turbo-generators, 150,000 kw. and 125,000 kw. capacity, to cost about \$25,000,000 with additions to steel tower transmission system.

Board of Education, Gary, plans installation of manual training equipment in new three-story high school, to cost \$1,000,000, for which bids will be asked at once on general contract. William B. Ittner, 911 Locust Street, St. Louis, is architect.

Mid-Continent Petroleum Co., Tulsa, Okla., has leased property at Yandes and Twenty-fifth Streets, Indianapolis, totaling 20,000 sq. ft., as site for new oil storage and distributing plant, to cost about \$60,000 with steel tanks and other equipment.

Airport Commission, Fort Wayne, has plans for new hangar, 80 x 140 ft., at municipal airport, with repair and reconditioning facilities, to cost close to \$30,000 with equipment. A. K. Hofer, Utility Building, is engineer. Theodore H. Paulman is secretary of commission.

Cincinnati

CINCINNATI, Feb. 3.—Machine-tool buyers are still cautious in placing orders. Bookings reported in January were scattered and consisted mostly of one or two machines for immediate requirements. However, the continued briskness of inquiry is creating an encouraging outlook and manufacturers believe that demand should show a definite upward trend within the next 60 days. Unfilled orders have been diminished appreciably and it is not likely that deliveries will be delayed more than six weeks in the present market.

Ohio Heat Treating Co., 914 East Third Street, Dayton, Ohio, has filed plans for a one-story mechanical shop addition, to cost about \$24,000 with equipment.

Rich Pump & Ladder Co., 1300 Harrison Street, Cincinnati, is contemplating a one-story addition, to cost over \$65,000 with equipment.

Kentucky Utilities Co., Louisville, is

planning an expansion and improvement program to cost \$2,800,000.

Seven Springs Bottling Co., Knoxville, Tenn., is planning extensions and improvements, including installation of bottling machinery, conveying equipment, etc. V. L. Denton is one of heads of company, in charge.

Gustav Drach, Union Trust Building, Cincinnati, architect, has plans for a six-story automobile service, repair and garage building at Columbus, Ohio, to cost over \$300,000 with equipment.

Southern Auto Supply Co., 615 Broad Street, Chattanooga, Tenn., automobile equipment and supplies, has filed plans for one-story and basement storage and distributing plant, 50 x 120 ft., to cost about \$65,000 with equipment. Maxwell James, Providence Building, is architect. D. A. Graves is general manager.

Electric Power Maintenance Co., 72 North Fifth Street, Columbus, has revised plans for a one-story works at Toledo, Ohio, to cost about \$60,000 with equipment. Langdon, Hohly & Gramm, Security Bank Building, Toledo, are architects.

Board of Trustees, University of Tennessee, Knoxville, is planning new industrial arts building at junior college group, including machine shop, forge, electrical and wood-working shops and laboratories, to cost over \$100,000 with equipment.

City Council, Newark, Ohio, will begin work on municipal airport in about 60 days, including hangar with repair and reconditioning facilities, oil storage and other field units, to cost about \$100,000. A fund of \$20,000 has been authorized for purchase of site.

Pennsylvania Pump & Compressor Co., Easton, Pa., has appointed Kring-Becker Engineering Co., Mercantile Library Building, Cincinnati, as its representative in the Cincinnati and Louisville districts.

Gulf States

BIRMINGHAM, Feb. 3.—Magnolia Petroleum Co., Dallas, Tex., is contemplating early construction of new oil refinery, with storage and distributing facilities, at Sweetwater, Tex., to cost more than \$2,500,000 with machinery.

Miami Toy Corporation, Ponce de Leon Boulevard, Miami, Fla., manufacturer of toys, swings, etc., is planning expansion and installation of additional equipment.

Central Power & Light Co., Frost National Bank Building, San Antonio, Tex., is arranging an expansion program, to cost about \$7,000,000, including completion of steam-operated electric generating plant near Del Rio, Tex., now in course of construction, and extensions in high-tension transmission lines.

White Packing Co., Parallel Street, Montgomery, Ala., meat packer, has plans for improvements and two-story addition to cost about \$200,000 with equipment. H. Peter Henschien, 1637 Prairie Avenue, Chicago, is architect and engineer.

Board of Education, Sonora, Tex., is considering installation of manual training equipment in new two-story high school, to cost \$130,000, for which bids will be received on general contract on Feb. 13. Anton F. Korn, Thomas Building, Dallas, Tex., is architect.

Birmingham Rubber Products Co., Birmingham, has acquired former plant of Birmingham Tire & Rubber Co., for new plant. Extensions and improvements will be made and additional equipment installed.

City Council, Shreveport, La., has authorized purchase of 333 acres as site for a municipal airport, to include hangars, repair shops, oil storage and other field units. A bond issue of \$300,000 has been voted.

Sewerage and Water Board, 526 Carondelet Street, New Orleans, is asking bids until March 20 for frequency changers, switchboards and affiliated electric equipment for a municipal sewage system. A. G. Moffat is secretary.

Pan-American Aero Corporation, San Antonio, Tex., is considering construction of one-story plant for assembling and parts manufacture for a student training school, to cost more than \$60,000 with equipment.

Hillyer-Fuller-Edwards Lumber Co., Glenmora, La., has authorized construction of new steam-operated electric power plant, to cost more than \$40,000 with equipment.

Southwestern Public Service Co., Amarillo, Tex., is arranging an expansion program to cost \$1,400,000, including power plants, transmission lines, distributing system and other work.

Chamber of Commerce, Marfa, Tex., is said to be interested in a project to construct an ore smelting plant on Rio Grande River, near Presidio, Tex., to cost more than \$2,000,000 with equipment. It is proposed to organize a cooperative company to carry out development.

St. Louis

ST. LOUIS, Feb. 3.—Usona Mfg. Co., 3510 Cheuteau Avenue, St. Louis, operating a general iron works, has awarded a general contract to Kremer & Volrol, Chemical Building, for one-story addition, 33 x 76 ft., to cost about \$22,000 with equipment.

Board of Education, Board of Education Building, St. Louis, is planning early call for bids on general contract for a five-story vocational high school, to cost about \$325,000 with equipment. G. W. Sanger, address noted, is architect.

Phillips Petroleum Co., Bartlesville, Okla., has authorized construction of gasoline refinery near Oklahoma City, Okla., operating under natural well pressure, with capacity of 50,000,000 cu. ft. natural gas per day, to cost over \$125,000 with equipment. Orders for primary apparatus are being placed.

Oklahoma Wheat Growers' Association, Enid, Okla., John Manley, manager, is planning construction of grain elevator, with elevating, conveying, screening and other equipment, to cost over \$175,000.

St. Louis Carbonic Ice Co., St. Louis, operated by R. H. Tait & Sons, Inc., 813 Hempstead Street, St. Louis, is planning one-story dry ice-manufacturing plant at Valley Park, Mo., to cost over \$40,000 with equipment.

J. R. Brockman Mfg. Co., 617 North Second Street, St. Louis, manufacturer of steam equipment and supplies, has plans for a one-story factory, to cost about \$100,000 with equipment.

Clement Studebaker, Jr., president, North American Light & Power Co., 231 South La Salle Street, Chicago, and associates, have organized Nebraska Natural Gas Co., with headquarters at Lincoln, Neb., and capital of \$1,500,000, to operate natural gas properties in different parts of State. Company has applied for permission to issue preferred stock in

amount of \$1,000,000 and common stock totaling \$500,000, part of proceeds to be used for construction program, including pipe lines, booster stations, etc.

International Harvester Co., 606 South Michigan Avenue, Chicago, has plans for an addition to factory branch and distributing plant at Springfield, Mo., to cost about \$70,000 with equipment.

City Council, Kirksville, Mo., is planning construction of municipal electric light and power plant, to cost over \$200,000 with equipment.

Pacific Coast

SAN FRANCISCO, Jan. 30.—Great Western Power Co., 530 Bush Street, San Francisco, is planning expansion and improvements near Hayward, Cal., including construction of substation and switching plant, and new steel tower transmission lines, to cost \$1,500,000.

Cudahy Packing Co., Union Stock Yards, Chicago, and 803 Macy Street, Los Angeles, is planning additions to local plant, including installation of additional equipment, to cost over \$150,000. Plans will be drawn by company engineering department, Omaha, Neb.

Petroleum Securities Co., Los Angeles, is planning to rebuild part of gasoline refinery in Kettleman Hills district, Cal., destroyed by fire Jan. 30, with loss reported more than \$200,000 including equipment.

Irrigation Engineering Co., 206 North H Street, Fresno, Cal., manufacturer of pumps, compressors, etc., has plans for a new one-story plant, 75 x 100 ft., on adjoining site, to cost about \$27,000 with equipment.

Board of Trustees, University of Utah, Salt Lake City, will soon ask bids on general contract for a four-story and basement engineering building, to cost about \$100,000 with equipment. Scott & Welch, Dooly Building, are architects.

Washington Water Power Co., Spokane, Wash., has arranged for a bond issue of \$15,000,000, part of fund to be used for extensions and improvements in hydro-electric power plants and high-tension transmission systems.

Board of Commissioners, Jackson County, Medford, Ore., is planning construction of one-story machine shop for County equipment repairs and parts, to cost about \$28,000 with tools. Paul B. Rynning, Medford, is county engineer, in charge.

Standard Gasoline Co., Los Angeles, a subsidiary of Standard Oil Co. of California, same address, has begun construction of new gasoline absorption plant in Kettleman Hills section, to cost about \$450,000 with equipment. Project will include a power station, machine shop and other mechanical units.

Portland Electric Power Co., Portland, Ore., has plans for an addition to steam-operated electric generating plant on East Lincoln Street, 71 x 100 ft., to include installation of a 45,000-hp. turbo-generator unit and auxiliary equipment, to cost more than \$1,000,000.

American Brake Shoe & Foundry Co., Los Angeles, has work under way on a new one-story foundry, 135 x 180 ft., at Maywood, including craneway, etc., to cost over \$100,000 with equipment. Charles B. Harp, Chamber of Commerce Building, is in charge of erection.

Canada

TORONTO, Feb. 3.—Machine-tool sales in this territory showed general improvement the past few days. The buying, however, was mostly for replacement and was confined to one or two units. Small tools are in steady demand.

Beauharnois Lumber Co., Beauharnois, Que., will start work next spring on erection of a paper mill to cost \$400,000. A dam also will be constructed to cost \$500,000.

Goodyear Cotton Co. of Canada, Ltd., Toronto, will build a four-story factory addition at St. Hyacinthe, Que., to cost \$600,000.

Canadian Potteries, Ltd., St. Johns, Que., has plans by Ross & MacDonald, architects, 1 Belmont Street, Montreal, for a one-story factory to cost \$400,000, to manufacture bathroom fixtures.

Excavation work is under way for erection of a plant at Smith's Falls, Ont., for Frost & Wood Co., Ltd., to manufacture harvester combines. John Davidson is general contractor.

Bids will be called about Feb. 15 by E. V. Buchanan, general manager, Utilities Commission, London, Ont., for three 1500-kw. transformers, 2300 to 13,000 volts, and other equipment.

Foreign

BIDS are being asked until April 21, by Spanish Oil Monopoly, Barcelona, Spain, for construction of local oil refinery with initial capacity of 5000 bbl. crude oil a day, including tanks and other storage and distributing facilities.

Officials of Air-Way Electric Appliance Corporation, Toledo, Ohio, manufacturer of vacuum cleaners and parts, electric heating heating apparatus, etc., are arranging for organization of British company, to be known as Airway, Ltd., with headquarters at London. New company will establish a direct factory branch, with storage, distributing and service divisions, parts replacements, etc.

Blaw-Knox Co., Blawnox, Pittsburgh, manufacturer of steel bins and other iron and steel products, is arranging an expansion program for its subsidiary in France, with headquarters at Paris, and is planning early construction of an iron and steel plant for business in that country, to cost over \$400,000 including equipment. A. C. Lehman, president, will soon leave for a trip abroad to arrange details.

Union of Coke Producers, Katowitz, Poland, has plans for a new plant for production of synthetic ammonia, to cost about 15,000,000 zlotys (about \$1,700,000) with machinery.

Government of Rumania, Bucharest, has awarded contract to David M. Oltarsh, 36 West Forty-fourth Street, New York, consulting engineer, operating Oltarsh Building Co., Inc., same address, for large housing development in connection with a city planning program to cost about \$100,000,000. Housing project is said to represent investment of over \$5,000,000; all construction machinery and equipment for work will be purchased and furnished by contractor.

MacDonald Engineering Co., 53 West Jackson Boulevard, Chicago, is arranging for early construction of flour mills and grain elevators at Moscow, Russia, in accordance with contract recently secured from Soviet Russian Government

through Amtorg Trading Corporation, 261 Fifth Avenue, New York, entire project to cost more than \$10,000,000. Nine members of staff of engineering company will supervise work and will leave at once for Moscow.

Koenigshuetter Gas Co., Warsaw, Poland, is arranging for an increase in capital from 600,000 zloty (about \$66,000) to 3,000,000 zloty (about \$340,000), in con-

nection with an expansion and improvement program, including enlargement of gas generating plants and extension of system to cities in Polish Upper Silesia. Entire project will cost \$1,500,000 with equipment, and additional funds will be arranged. A sale of preferred stock will be carried out in United States under direction of Foreign Trade Securities Co., Ltd., 43 Exchange Place, New York.

The Week's News Quickly Told

Current Events That Bear on the Course of Business

PROFITS in 1929 of 806 industries and businesses amounted to 4048 millions of dollars, or 12½ per cent more than in 1928, according to the National City Bank of New York. Amusements showed the greatest percentage of gain, 85.6, but iron and steel was second with 70.7 per cent. Machinery's gain was 36.4 per cent. The figures are preliminary . . . Dividends declared in January were greater in the aggregate than a year ago. . . . December sales of chain stores in the New York Federal Reserve District were 5.2 per cent greater than for December, 1928, but the sales per store fell off 2.5 per cent.

SUGGESTING that repairs, maintenance, replacements and betterments should be done in the next two or three months, Chairman Julius H. Barnes, of the executive committee of the National Business Survey Conference, has written to 20,000 manufacturers.

COMMODITY average declined last week, according to Prof. Irving Fisher's index number of commodity prices. Based on 100 as the 1926 average, the week's figure is 93.3 compared to 93.7 for the preceding week, which was the highest since October. This year's lowest was 93 in the first week of January . . . Car loadings for the week ended Jan. 18 totaled 847,353, a decrease of 15,838 from the week before.

GOLD arrivals in United States last week reached \$5,304,000. Exports were only \$34,000. Japan furnished \$2,000,000 of our imports . . . Loans contracted in United States by South and Central American national and city governments rose from \$117,050,000 in 1924 to \$344,598,000 in 1928. There was a decline for 1929 of \$66,040,000.

THE Bank of France reports the largest gold reserve in its history . . . Selection of an edifice in Basle, Switzerland, to house the Bank of International Settlements has been made . . . A fund of \$5,000,000 is being amassed by a group of London financiers with a view to the formation of an aircraft construction and sales organization comparable in magnitude to General Motors Co.

IMMEDIATE establishment of a commonwealth of the Philippines is called for by a bill introduced in the Senate. It would grant autonomy within ten years . . . Primo de Rivera, for six years dictator of

Spain, has resigned. He is replaced by General Damaso Berenguer, who is seeking the formation of a civilian, constitutionally controlled government.

INTERSTATE Commerce Commission has authorized a \$2,000,000,000 merger of the New York Central Railroad with its subsidiaries, the Big Four and Michigan Central Railroads, through long term leases . . . The International Telephone & Telegraph Co. has issued \$50,000,000 in bonds; St. Louis, \$9,000,000; and San Francisco plans an issue of \$60,000,000 to finance the acquisition of private electric utilities in that city.

HIGHWAY improvements to cost \$300,000,000 to be financed jointly by the Federal and state governments are asked in a bill passed by the United States Senate . . . Pittsburgh industrial interests are becoming active in behalf of a Federal bill introduced by Pennsylvania's Senator Reed, which calls for a survey of the Beaver, Mahoning and Shenango rivers section of the Lake Erie and Ohio River canal project with a view to deepening that section of the waterway. An adjustment of the Lake coal tariffs is in view if the bill passes.

WARTIME powder manufacturing activities of the E. I. du Pont de Nemours Co. resulted in a financial loss to the company which wiped out the profits of twenty years activity in the making of explosives, according to Pierre S. du Pont, who made a sharp rejoinder to George Bernard Shaw's conception of a typical munitions maker as an individual with a deep hatred for peace . . . An order for the construction of two 10,000-ton cruisers has been canceled by the British Admiralty.

CASH dividends once declared cannot be rescinded, according to a pronouncement of the American Association of Legal Authors, which cites precedents in support of the contention and comments on a recent announcement of the cancellation of a dividend, following the stock market crash, by an unnamed corporation. Stock dividends, however, can be withdrawn after they have been voted, the legal presumption being that their issuance does not enhance the value of the stockholders' equity.

CONSTRUCTION of a nationwide net of foot paths was urged by Edward A. Filene of Boston, speaking before the National Boot and Shoe Manufacturers' Association.

EDITORIAL STAFF

A. L. FINDLEY
Editor

W. W. MACON
Managing Editor

G. L. LACHER
C. E. WRIGHT
S. G. KOON
G. S. HERRICK
R. A. FISKE
T. H. GERKEN
R. G. MCINTOSH

E. E. THOM
E. F. CONE
R. E. MILLER
F. L. PRENTISS
L. W. MOFFETT
GERRARD FRAZER
Cincinnati

THE IRON AGE

ESTABLISHED 1855

Member of
Audit Bureau of Circulations and of
Associated Business Papers, Inc.

Published Every Thursday by the
IRON AGE PUBLISHING CO.

239 West Thirty-ninth Street, New York

F. J. Frank, President

G. H. Griffiths, Secretary

ADVERTISING STAFF

C. S. BAER
General Advertising Manager

W. B. ROBINSON
Pittsburgh

F. S. WAYNE
Chicago

D. C. WARREN
Hartford

EMERSON FINDLEY
Cleveland

B. L. HERMAN
Buffalo

CHARLES LUNDBERG
Philadelphia

W. C. SWEETSER
New York and
New Jersey

PEIRCE LEWIS
Detroit and
Cincinnati

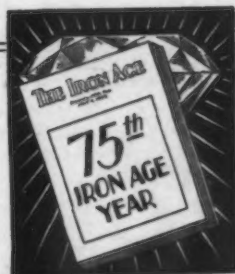
C. H. OBER
New York

Contents for FEBRUARY 13, 1930

Straight-Line Production of Stoves 493	Norwegian Electric Alloy Pig Iron 508
Eliminates Much Hand Labor Between Press Room and Assembly Department	
X-Raying Large Steel Castings 499	Total Ore Shipments Near Record 557
Minute Examination of High-Pressure Steam Fittings on Large Scale	
Alloy-Steel Sheets for Aircraft 502	Many Copper Records in 1929 558
How They Are Made; Physical Properties and Heat Treatment; Effects of Welding	
Various Steels Are Used for Gears 506	German 1929 Steel Exports Heavy 558
Oil-Hardened Chromium and Case-Hardened Nickel Steels for Rapid Production	* * *
Welding in Fabrication of Cranes 509	New Equipment 519
Both Shop Work and Field Erection of Large Gantry Cranes Use Method	
Structural Steel Heat Treated 510	This Week's IRON AGE in Brief 524
High Elastic Limit Produced by Quenching and Drawing, Including Welded Joints	
Steel Treaters in Winter Meeting 515	Foreign Steel Markets 527
Alloy and Nitrided Steels and New Man- ganese-Chromium Steel Discussed	
Discuss Costs and New Uses 522	EDITORIALS 530
Steel Founders See Widening Market for Steel Castings Applications	
Commodity Prices in Downward Trend 523	The Week in Business 533
Economist Thinks Lower Pig Iron and Steel Quotations Are in Prospect	
Steel Ingot Output Recovers Well 529	Iron and Steel Markets 534
January Production 21 Per Cent Higher Than December on Daily Basis	
	Non-ferrous Metal Markets 551
	Personal Notes 554
	Machinery Markets 561
	New Trade Publications 565
	The Week's News Quickly Told 566

Owned by the United Publishers Corporation,
239 West 39th Street, New York. A. C. Pear-
son, Chairman. F. J. Frank, Pres. C. A. Mus-
selman, Vice-Pres. F. C. Stevens, Secy. and
Treas.

BRANCH OFFICES—Chicago: Otis Building.
Pittsburgh: 811 Park Building. Boston: Room
230, 80 Federal St. Philadelphia: 1402 Widener



Building. Cleveland: 1362 Hanna Building.
Detroit: 7338 Woodward Avenue. Cincinnati:
409 Traction Building. Buffalo: 616 Ellicott
Square. Washington: 536 Investment Building.
San Francisco: 703 Market Street.
Subscription Price: United States and Posses-
sions, Mexico, Cuba, \$6.00; Canada, \$8.50; For-
eign, \$12.00 per year. Single Copy 25 cents.

Copyright, 1930, by Iron Age Publishing Co.

Without
the Least
Reservation



WE MAKE THIS STATEMENT:

The Hartness Comparator
will tell more about a screw
thread than any other gage
on the market. Furthermore
it will do it easier, quicker
and surer

JONES & LAMSON MACHINE CO.
Springfield, Vt.

